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PASTEUR IN HIS LABORATORY

ANNALS OF MEDICAL HISTORY

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GUY PATIN AND THE MEDICAL PROFESSION IN PARIS IN THE SEVENTEENTH CENTURY

By FRANCIS R. PACKARD, M. D.

PHILADELPHIA, PA.

(continued)

THE younger son of his friend Belin[1] came to Paris to study medicine and Patin welcomed him to his house where, for a time, he came frequently. Then he remained away. Patin examined him every time he came. After his absence the examination was not satisfactory and Patin advised his father to take him back to Troyes. One can easily divine that the young man's visits to Patin were not an unmixed pleasure, for Patin thought he was indulging in debauchery. Patin's letters about him to his father are very kindly worded. In 1646 young Belin ran away from Paris and joined the army, owing Patin money and what was worse not having returned some books which Patin had lent him. Sometime afterwards young Belin wrote to Patin telling him with whom he had left his books, thereby reconciling himself to him, and later wrote again asking Patin to intercede with his father for him.

Patin wrote to Belin, fils, on October 17, 1642, an interesting letter of advice as to the reading the young physician should pursue.

Read only Hippocrates, Galen, Aristotle, Fernel, Hollier, Duret, Sylvius, Riolan, Tagault, Joubert, and very little of others, *in quibus Hofmannus ipse dux regit examen*. I am having printed here another book by him, of which I will make you a present in about a month as the author himself has sent it to me. Read the good theses of our school. Look at those which you have of them, to the end that I may send you the best if you have them not. While you have a little leisure, read all that Thomas Erastus has written and especially "De occultis pharmacorum estatibus," and his four volumes "Adversus novam medicinam Paracelsi." Read also every day the "Aphorisms," the "Prognostics," the "Prorrhetics," the "Epidemics or the Coaques" of Hippocrates. On the "Aphorisms," take of all but three commentators; to wit, Heurnius, Hollier, and Galen.

Again he tells young Belin, October 24, 1646:

Read every day some good book, and learn by heart, if you do not know them already all the "Aphorisms" of Hippocrates . . . Do not let any day pass without studying at least eight hours. Read carefully the "Pathology" of Fernel and the first four books of his "General Method"; add to it the practice of J. Hollier, with the Enarrations of M. Duret, and the "Aphorisms" of Galen, of Hollier, and of Heurnius. The best surgeries[2] are those of J. Tagault and of Gourmelin.

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[1] This was not the Belin, fils, with whom Patin corresponded. His letters were addressed to Claude Belin II; the lad who studied at Paris was yet another Claude, according to Triaire, who was registered as a physician at Troyes in 1654.

There are three treatises by Galen which you should choose and read something frequently in them, to wit: "De locis affectis; de morborum et symptomatorum causis et differentiis," and his books on the "Method." You will do well to add that which he wrote by way of commentaries on the "Epidemics" of Hippocrates. If you desire another pharmacy than the "Method" of Fernel, read Renodaeus but do not let yourself be carried away in the current of so many promises as do the antidotaries who are destitute of experience. Nevertheless it is necessary to know something of compositions for fear that the apothecaries *artis nostrae scandala et approbria*, can take the bar over you . . . Do not lose your time reading many of the moderns who only make books of our art from lack of practice, and from having too much leisure. Above all flee books on chemistry, *in quorum lectione oleum et perdes*.

It should be noted that, in a certain sense, Patin was not a reactionary. He was an upholder of the Old Greek medicine, that of Hippocrates and Galen, against the pseudo-Greek medicine of the so-called Arabian school. For many centuries the Arabians had captured the preeminence in medical teaching and belief. The works of Avicenna, Avenzoar, Rhazes, and their fellows were the guides in whom the medical profession of Europe founded their faith until well into the sixteenth century, and the Arabic traditions died hard, lingering into the seventeenth century. The new school comprised those who had taken up the new remedies introduced by Basil Valentine, Paracelsus, van Helmont, de Mayern, and many others. As these chemists compounded many formulae and believed implicitly in the efficacy of their various preparations against diseases, Patin could not see any good in their teachings, but only saw in them a new set of therapeutists who, as the Arabs, disregarded the teachings of the Greeks, as to the supreme importance of observation and diagnosis, and the *vix medicatrix natura*, in their desire to invent new remedies, and panacea. Other wiser but less prejudiced physicians than Patin, felt as he did that the salvation of medical practice lay in a return to the Greek tradition. Two men especially did much to promote this end. René Chartier, to whom Guy manifested such bitter enmity, published the works of Hippocrates and Galen in Greek and Latin with annotations, and Foesius published his magnificent Hippocrates in Latin, thus placing the works of the great master within reach of the many physicians who knew Latin but not Greek. There was a great division in Patin's time between the iatromathematical school, represented by Borelli and Sanctorius, and the iatrochemical school whose foremost representatives were van Helmont, Franciscus de le Boë, or Sylvius, and Willis of England. The former held that all bodily actions and functions could be explained by the laws of physics. The iatrochemists held they were due to chemical activities in the organs and tissues. Patin's inclinations were evidently with the iatromathematicians, though he shows but little interest in the many great advances in anatomy which were made during his lifetime. He mentions the writings of men like Steno, Sanctorius, de le Boë, but chiefly praises or dispraises them for their typography, or binding. He lauds highly those authors who adhere to the Hippocratic tradition and condemns virulently those who show any tendency to use the much detested "chemical" remedies, such as antimony. I have referred elsewhere to his views about van Helmont. Harvey's book, the greatest contribution to medical science of his age, or for that matter any other age, the "De motu cordis" published in 1628, is only referred to in connection with the publication of books attacking his demonstration of the circulation of the blood by Patin's friend, Riolan, or by Primrose of Bordeaux.

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[2] It will be noticed that throughout his correspondence Patin never recommends the surgery of Paré, except when he himself added anonymously a treatise on fevers to a posthumous edition of Paré's works, but even then he does not refer to any excellence on the part of Paré's own books. Gourmelin was the bitter enemy of Paré and it was in reply to his attacks that Paré wrote his "Apology and Journeys in Divers Places," 1575.

Another young medical student for whom Patin acted as mentor at Paris was Noël Falconet, the son of Patin's correspondent André Falconet. Their family contained many distinguished physicians. Charles Falconet was physician to Marguarite de Valois, the first wife of Henry IV. His son André, Guy's correspondent, was born in 1612, and died in 1691. He practiced medicine at Lyon. When his son Noël came to Paris to pursue his studies Patin manifested the same fatherly interest in him as he had shown in young Belin. Young Falconet came to Paris in 1658. When Falconet wrote to Patin that he intended to send him there the latter replied (September 24, 1658), advising him to keep him at home rather than send him to Paris:

> Here the youth are marvellously debauched. You would make him a physician? He could study his philosophy at Lyon and later you could send him here for one or two years to study medicine. If your son remains near you, you will be more his master, his health will fortify itself, and he will be more capable of believing me in a year, if I am yet here. When he shall have studied here sometime, it will be necessary to make him pass doctor (get his degree) in a short time, and afterwards retire him near you, when he will follow you to your patients, and learn more in three months than in four years at Montpellier, where I hear that the young men are very debauched. I have many examples of it but take little interest in them. Being at Lyon near you, he can render you a good account of his leisure and at his ease and to his great profit he will read Hippocrates, Galen, Fernel, and Duret . . . If you retain your son at Lyon to study his philosophy, try to make him study Greek as well so that he will know his grammer, the New Testament, Lucian, Galen, and Aristotle. In two years he will be more robust and better able to stand his first winter at Paris, which is extraordinarily severe for newcomers and to the young, and even then he should be sent here in the month of August so that he may pass the autumn here and become accustomed (acclimated) before the winter comes.

Falconet did not take this sage advice but sent his son to Paris in the autumn of 1658. Falconet asked Patin to take him to live with him as a house-pupil. Patin writes, October 29, 1658:

> I have never wished to take anyone *en pension*, although I have been asked to many times, but I can refuse you nothing. You talk to me of the price of board and lodging. I do not know what it is, I demand nothing of you. Tell me only if you wish him to study philosophy and what wine you wish that he should drink. For the rest he shall be nourished in our ordinary fashion, which will suffice a student.

Patin writing to Falconet (January 3, 1659), gives a pleasant picture of his home life and of the hospitality with which he treated his son. He tells him how the boy has enjoyed seeing the beautiful churches of Paris, and of some theological questions which they had discussed together, and how Noël goes frequently to see his son, Charles, at his house in the Rue Saint-Antoine, "where he always sees something beautiful." Charles being a numismatist, had many beautiful pictures and medals.

> Often after supper warming ourselves about the fire, I talk to him of the great events of our history, of the deaths of the three kings, Henri II, Henri III, and Henri IV, of the deaths of the two Guises at Blois in 1588, of the Maréchal de Biron, of the Marquis d'Ancre, which I make him read near me in our historians. He says that Jacques Clément and Ravaillac, who killed Henri III and Henri IV (who I tell him were very good kings) were wicked rascals . . . He has a great wish to go there (to Cormeilles) at Easter with my wife, and see all our trees in blossom. We have there five hundred little pear trees without counting the prunes, peaches, apricots, mulberries, and fig trees, and will return from there to Saint-Jean where he will see two hundred cherry trees charged with ripe cherries. For

three years I have had a great wish to take you there, but you have (when here) too much business; he will view them in your place. Our house is near the mountain on which we have a windmill from the top of which one sees the great spire of our church at Beauvais. We will show him that and teach him the topography of all the environs and suburbs of Paris.

When Chereau sought Patin's country house at Cormeilles he found only the cellars remaining, a new mansion having been built. There still existed vestiges of the windmill, and many cherry trees flourished on the grounds.

Guy's second and favorite son Charles "mon Carolus," was evidently a great friend of the young student. Patin writes Falconet somewhat later in the same month that Charles has promised to take Noël on the anxiously desired country trip at Easter.

In August, 1659, Guy tells of taking him walking and showing him the Latin motto on the great clock of the Palais de Justice, advising him to copy it as a good sentiment. Then they went to Cormeilles together, and on their return Patin took him to see the execution "of a thief who was broken on the wheel. They gave us a chamber from the window of which he saw all the ceremony of this mystery of destroying men for their crimes." This was done to inculcate a moral lesson, as Patin adds: "It was not without expatiating to him on the unhappiness of the wicked who resolve to steal and kill to have money for debauchery and gambling." Robert Patin was attending the wife of one of Mazarin's household who was ill at Vincennes, and he took his mother and young Noël Falconet in the carrosse with him when he went there one day in order to show them the chateau. Patin (October 6, 1659) telling the father about this little excursion, adds, "he promises marvels, God give him grace to do well."

Patin (April 6, 1660) writes Falconet:

> Since you do not wish your son to go to Lyon for his vacation I am well content. He will go eat of our good cherries and mulberries at Cormeilles, afterwards he will return here to learn the "Compendium" of Riolan, the father, and the "Enchiridium" of Riolan, the son. After that the winter will come, our public acts (demonstrations) and frequent dissertations will occupy him; you know these are the fundamentals of our profession. Finally he will study the pathology and general method of Fernel, with the "Aphorisms" of Hippocrates and the "Commentaries" of Hollier. I will make him write on paper the good things and practices. I will also take him to see patients where he will learn the *modus agendi*. All this can be done in thirteen or fourteen months and afterwards he can return to Lyon to see you and report to you on his studies.

Possibly young Falconet was aware of Patin's weakness and flattered him somewhat because Guy writes to his father, July 2, 1660:

> Noël Falconet acquires every day some degree of wisdom, and will answer well. He greatly loves to be near me and hear me talk. Day before yesterday after dinner, as we were talking together, there came an honest man, with whom I talked about a half-hour, and then took him into my office to give him a prescription. This man, an officer of the king's, looked at him much and when we were alone he said, "that young man there listens to you attentively and wishes to learn. Ah! but if I was in his place I would profit by your presence."

Patin adopted the usual method of instruction, making his pupil learn from books and notes. He writes (August 10, 1660) that he is going to make Noël "learn by heart the first chapters of the 'Compendium' of M. Riolan, the father, and afterwards his commentaries on the physiology of Fernel, with the 'Enchiridium' of the son. It is the way I taught my two sons, and it succeeded there very well."

Apparently young Falconet only stayed temporarily at Patin's house because Guy writes his father, September 21, 1660:

> Noël Falconet studies and often asks me good questions. I lent him some books to study but he wished to have his own, so I took him to the Rue Saint-Jacques[3] and bought for him in his pres-

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[3] The Rue Saint-Jacques was the great bookshop center of Paris at that time.

ence the works of Riolan, the father, in two volumes in octavo, and the "Enchiridium anatomicum et pathologicum" of the son. I have also promised him a "Perdulcis," and have lent him a Fernel in folio which he likes. He wishes also the "Anthropographia" of M. Riolan, and Hollier in "Aphorismos Hippocrates, Quia Conciliavit Doctrinam Veterum cum Nostra Methodo Parisieni," which is better than that of the Italians.

THE PHARMACOPEIA OF PARIS

In a letter to Belin, January 18, 1633, Guy writes of the "Dispensatory" which the Parlement of Paris had ordered to be compiled by the Faculty in 1590. There was no official pharmacopeia or dispensatory (Guy elsewhere refers to it as an *antidotaire, guidon des apothicaires, etc.*), in France. The only one in Europe was that of Valerius Cordus published by order of the senate of Nuremberg in 1555, entitled "Dispensatorium pharmacorum omnium quae in usa potissinum sunt.[4] Patin says the French apothecaries used as textbooks the "Antidotaire" of Nicholas Praepositus of Salerno, first printed in 1471; and the "Dispensatorium Galenochemicum" of Renou. (Renodaeus, 1608.) The order says it was to be made by twelve members of the Faculty. These having died, those who replaced them allowed the work to lapse, saying that such a publication would only serve to maintain the rascality of the Arabs to the profit of the apothecaries, and Guy[5] quotes the Piètres in support of this view adding that three grains of senna in a glass of water purge as well or more surely than a heap of arabesque compositions. He says the apothecaries do not like him for his practice but that the people are so tired of their barbaresque tyranny and bezoardesque cheating that it is easy to escape from their, the apothecaries, hands. According to Guy there is no better pharmacopeia than " 'Le Médecin Charitable' reinseignnant la manière de faire et préparer à la maison, avec facilité et peu de frais les remèdes propres à toutes les maladies selon l'advis du médecin ordinaire," written by Philibert or Philippe Guybert, which was immensely popular. Guy wrote a "traité de la conservation de la santé" which was added to the book in its 17th edition.

The Pharmacopeia of Paris was finally published in 1628, and entitled "Codex medicamentarius seu pharmacopoeia parisiensi."

Years afterwards (July 20, 1656) we find him again writing Belin, that there is no better way to defeat the apothecaries than to introduce into families "Le Médecin Charitable" along with a syringe, bouillons and ptisans, made with senna and other emollient herbs.

PATIN'S DOMESTIC CIRCLE

On October 10, 1628, Patin married Jeanne de Jeanson, the daughter of a rich wine merchant of Paris, whose mother was a daughter of the celebrated Miron, the provost of the merchants of Paris. Ten children were born of the union, of whom but four attained adult age, namely, Robert, the physician; Charles, the physician and antiquary; Pierre, of whom we only know that he became a Master of Arts in 1649, and that he signed the act of decease of his father in 1672, and François, who became a soldier and was killed in a duel by one of his comrades at Plessis-Bouchard, October 9, 1658. He was buried in the church at Cormeilles the next day. Chereau[6] was shown by the curé at Cormeilles-en-Parisis an old parochial register containing the following entry:

> Ce mesme jour, 10 Octobre, 1658, François agé d'environ dix-neuf ans, fils d'honorable homme Mr. Guy Patin, docteur régent en la Faculté de médecine de Paris, a este inhumé en la chapelle, Nostre Dame: lequel François Patin a este tué le jour précédent, par un sien camarade de guerre, entre Francomille et le Plessis-Bouchard.

As there is no reference to the career or the loss of this son in Patin's letters, it may be presumed that there was an estrangement between the father and son.

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[4] Triaire, note on p. 59.

[5] Letter to Belin, in 1643.

[6] *Union Médicale*, 1864, 2d series, xxiii, 401, 449.

Guy writes to Spon (May 25, 1648) with curious candor about his wife's relatives:

> For eight whole days I have been hindered near my mother-in-law, who has been very ill with a pleurisy of which she, Dieu merci, was quit, by means of four bleedings which she has borne very well, in as much as she is nearly eighty years old. The good man is scarcely less, and they are on the eve of leaving me for my part an inheritance of 20,000 crowns, *et vir sapiens non abborrebit.*

Patin's father-in-law showed no inclination to hasten the fulfilment of his hopes. Two years later (February 4, 1650) Patin writes Spon:

> My father-in-law has again obtained some respite from the park (cemetery). In this last attack he was bled eight times from the arms, and each time I made them take nine ounces from him, although he is eighty years old. He is a fat and full-blooded man. He had an inflammation of the lungs with delirium, and, in addition, stone in the kidneys and bladder. After the bleeding I had him well purged four times with senna and syrup of pale roses, by which he has been so marvellously relieved that it is miraculous, and he seems rejuvenated. Many people would not have believed it and would believe rather some fable of a julep cordial. He shows me much contentment but although he is very rich he gives no more than a statue. Old age and avarice are always in good intelligence with one another. Such men resemble pigs which leave all in dying, but are only good for anything after they are dead because they are good for nothing during their life. It is necessary to have patience, I will not neglect to take good care of him. God has given me the means to do without the wealth of others, and live content till now without ever thinking evil.

Patin's mother-in-law died on July 8, 1650, and he wrote to Spon on July 26, 1650, and again on August 8, 1650, describing her last illness, an apoplexy, and rendering her a somewhat piquant last tribute. She was eighty-two years old. Patin was at Paris but hastened to her country place at Cormeilles where she was taken ill.

> I found the good woman in extremity . . . She had been bled and cupped in awaiting my coming by the surgeon of the place, in such sort that there remained nothing for me to prescribe . . . Finally she died in the evening and was buried in the church there the next day with much ceremony, very useless and superfluous . . . We brought back the good man her husband the next day, who is more decrepit than she was although several years younger . . . There is hope that after his death we will have a great inheritance . . . She was an excellent woman in the care of her household and in the pains which she took with it . . . I can not give myself the pain of weeping much for her seeing she was too old and too often ill . . . Do not weep much for the death of my mother-in-law, she was not worth it. She was a good woman, very rich and avaricious, who feared nothing so much as death which nevertheless seized her quite suddenly at the end, at her beautiful country house at Cormeilles. She has gone before where we will go after. Let us try at least to go there with more tranquillity and (better) reputation, and that our children may be thankful to us as good fathers, in meriting from them veritable gratitude.

Patin only refers to his wife in a very casual way throughout the correspondence. He speaks once of her pride in their good fortune as we have seen, but she seems not to have entered much into his thoughts or affairs. He hints at her rather disparagingly in a letter to Spon (October 5, 1657). The latter's wife had visited Patin at Paris and the latter writes:

> Mon Dieu, but she is a worthy woman. Ah! but you are fortunate to have one so good, so perfect, and of such good humor. Mine has many very good qualities, but she is sometimes cross and cruel to valets and maids, which are characteristics I hold for nought, but she has them *Jure gentilitio.* Her deceased mother who lived eighty-four years was of the same humor. You have been more fortunate than others. Is it that God mixes in your affairs?

ROBERT PATIN

As already stated, they had four children who attained adult age. Robert, born in

1629, is frequently mentioned in the course of his father's correspondence. Some of Guy's letters are written in his hand, he evidently having acted as his father's secretary. Patin wrote to Spon in May, 1648, telling him of his joy that Robert had received his degree of Bachelor of Medicine at the age of nineteen, the youngest of his class. They quarreled on occasions and there was a serious breach between them at the end of Guy's life. In a letter to Spon in 1649, Guy wrote that Robert could do very well if he wished, but that he did not like to study and was volatile and flighty. He married Catherine Barré in 1660. Writing to Belin, fils, June 2, 1660, he says that two days before, he had married his eldest son to a beautiful girl, who comes of honest people, to whom he had been the physician for twenty-five years. "She is beautiful, she is rich."

Patin gave up his chair of *Professeur du roi* to Robert in 1667. He wrote to Falconet (August 12, 1667):

> Yesterday my eldest son, Robert Patin, took possession of the charge of *professeur royal,* for which I had obtained for him the succession. It has come with a good augury, because he celebrated by his harangue his natal day, having been born the eleventh day of August, 1629. I pray God that he may enjoy it a long time. I have raised my children with great care and great expense. I hope they will reap agreeable fruits from it.

Robert died of phthisis on June 1, 1670. Chereau[7] gives the following entry from the register of the church at Cormeilles:

> Le deuxieme jour de juin mil six cent soixante et dix a este inhumé dans l'église à la chapelle de la Vierge, Mr. Robert Patin, docteur en la Faculté de médecine de Paris, demeurant à la paroisse de Saint-Germain-de l'Auxerrois à Paris; en presence de Mr. Guy Patin, aussi docteur et professeur du roi, son père, et de Pierre Patin, son frère qui sont signé.

Although Charles was undoubtedly his favorite son, and Robert seems at times to have caused his father some vexation, nevertheless Patin was sincerely grieved when Robert died at the age of forty-one, but a few years after succeeding to Guy's professorial chair at the Collége Royal. In May, 1670, he refers on several occasions in his correspondence to Robert's illness, which seems to have made a rapid progress towards its end. He sent him, accompanied by his wife and his mother-in-law, out to his country place at Cormeilles in the hope that the change of air would help him. The bereaved father wrote to Falconet (June 4, 1670):

> At length, Monsieur, I am desolate, *o me miserum!* my eldest son died, the first of June. God wished to have his soul! he died a good Christian with great regret for his faults, *et cum maxima in Christum fiducia.* I pray God with a good heart that he will preserve you and those who belong to you. It is not necessary to go so soon, one dies soon enough . . . He died at Cormeilles, where he had been taken to have an air more pure than that at Paris. He was buried near his maternal grandmother and his brother François in the chapel of Notre Dame, near to the choir. *Requiescat in pace.* I am so broken down with sorrow at his death, and so fatigued by the journeys which his illness caused me to make, that I am capable of nothing. I pray you to witness my sorrow to M. Spon to whom I have not written of this misfortune because I am so much afflicted, and from whom I do not even ask consolation. It is necessary that I weep all my life for a son so learned . . . He leaves three boys and a little girl, of whom the eldest is nine years, and from whom I hope for some consolation, because he has much ésprit, learns well, and is very gentle. We will do that which pleases God, who holds in his hand the good and bad fortune of men.

In 1669, Robert according to Sue had gotten his father's signature to a document which enabled his wife to interfere in the disposition (*affaires*) of Patin's estate after his death, so that it was necessary to sell Guy's library of upwards of 10,000 volumes after his death, in order to satisfy her claims. The old man wrote to Falconet in July, 1671, a few months before his death,

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[7] *Union Médicale,* 1864, 2d series, xxiii, 401, 449.

"that the diversity of the studies of his son Charles consoled him in some sort for his absence, but that the maliciousness of Robert confounds him." "This ingrate has deceived me wickedly, even while dying, that which I would never have thought of an older son in whom I had trusted entirely."

CHARLES PATIN

Charles Patin was born on February 23, 1633, studied law and became an advocate at Paris in 1648, but in 1654 gave up his legal career and took up that of medicine. Patin tells Belin[8] that at the age of fourteen years he has been examined publicly in Latin and Greek philosophy, before a large audience and got his degree of Master of Arts. "I am going to put him back at his humanities for another year and then make him study law, so that some day he can defend me if the apothecaries undertake to attack me again." Writing to Garnier, a physician of Lyons, November 2, 1649, Patin says, "My Charles is studying law, but I would like it better if he would employ his time at medicine for which I find him much better suited. I talk to him of it often and he knows more of it than his elder brother; finally, I would prefer that he should be a physician rather than a lawmaker, I would teach him many fine observations." In a letter to Spon in 1649, Guy says he is better poised and loves to study more than his brother Robert, and that he is very learned in "Greek philosophy, geography and law." His portrait depicts a bright intelligent countenance of much physical charm. Writing to Spon (December 10, 1658) Patin tells him:

> It is very cold but we have wood to heat us, added to which it is warm in my study, and we study all the evening tête-à-tête until the hour for supper, and after that we talk around the fire of some agreeable matter, physics, history, or politics. Our Carolus always relates to us something curious. He loves ancient times and talks gaily of them to us, so much so that we often go to bed an hour later than we had resolved to.

He was apparently on the high road to success. He seems to have been a popular lecturer on anatomy, for Patin (December 16, 1659) writes to Falconet:

> My son Charles is teaching anatomy in our school on the cadaver of a woman. There is so great a number of auditors that besides the theatre the court yard was filled. He begins well at twenty-six years, I hope he will finish better. He has many friends who love him. His studies have acquired him many and his courtesy yet more.

On November 24, 1667, Guy wrote to Falconet describing with what éclat Charles had participated in a discussion on the relative merits of Homer and Virgil, and that Lamoignon, the President of the Parlement of Paris and one of the chief men in the city, had shown him marked favor, yet a few months later, in February, 1668, Charles had fled from France and was sentenced to the galleys in contumacy. Patin writes of it to Falconet (March 7, 1668) as follows:

> I write lastly to you about the affair of my son in which I had expected that the knowledge of the truth and the succour of my good friends would have remedied it, but hope, according to the sentiment of Seneca, is the dream of a man who ages. Nevertheless, since it is a virtue, I would not abandon it whatever should arise, for it is permitted even to the most wretched to dream and to deceive themselves. Everybody pities him, no one accuses him, and with the exception of some publishers he is loved by everybody. Meanwhile he is absent and we are obliged to resign ourselves in spite of his stoicism. He had always hoped that the justice of the King would be extended to him but our enemies had too much credit. Meanwhile, to soothe our wound, they say, (1) that his process had been made in contumacy, as a man absent, who could not defend himself; (2) that it was by royal and special commission and without right of appeal which is extraordinary and shows more than ever the design they had to condemn him; (3) that most of his judges had received *lettres de cachet* and the recommendation that it was necessary to make an example. But to what could serve this example? Is it that while the Hollanders and others print books of history, and chiefly of our country, of which the authors live

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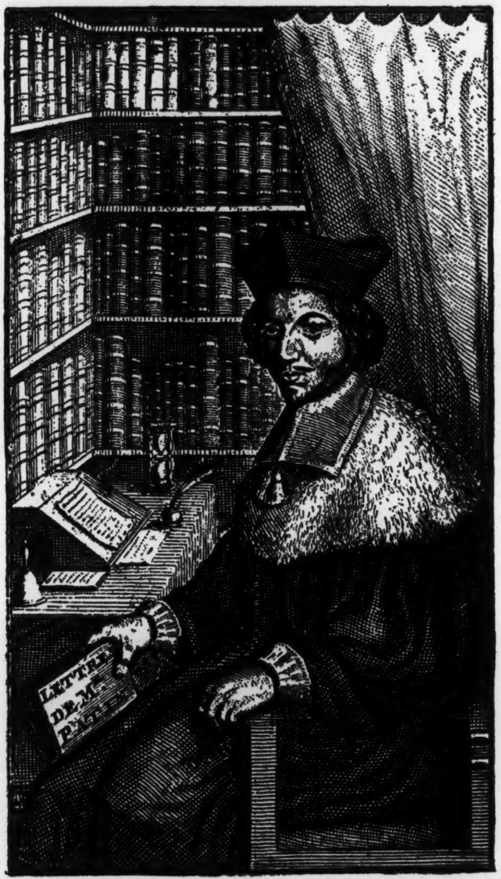
[8] Letter, August 18, 1647.

in Paris, one can take from individuals the desire and curiosity to read them? (4) They allege it was a man of great standing who was our secret adversary who moved the wheels and intrigued against us, because they found among his books some volumes in defense of M. Fouquet, and of the enterprise of Gigeri.[9] Why do they not punish the authors of these books? Why do they not prevent their publication in Holland, or their importation into France? All these books, and others like them, have been sold at Paris by the booksellers at the Palais and in the Rue Saint Jacques. It excites the desire to see these books that one would suppress and hide with so much rigor . . . They have named three books, to wit, one full of impiety, a Huguenot book entitled, "L'Anatomie de la Messe," by Pierre Dumoulin, minister of Charenton; as if the Inquisition was in France! It was sold for six sous. Paris is full of such books, and there is scarcely a library where one cannot find them, even with the monks. There is liberty of conscience in France and the booksellers sell them every day. It is even permitted to a man to change his religion and become a Huguenot, if he wishes; and it will not be allowed a studious man to have a book of this sort; also he had only a single copy. The second was a book, which they said was contrary to the service of the King. It was the "Bouclier d'État," which is sold publicly at the Palais, and to which they are printing here two answers. The third is "l'Histoire galante de la Cour," which consists of little libels more worthy of contempt than anger. I think these three books are only a pretext, and that there is some secret enemy who is angry at my son, and the cause of our misfortune. I hope that God, time, and philosophy will deliver us and put us at rest, and in waiting, Lord God, give us patience. It is necessary in this world to be either the anvil or the hammer. I have never had great care, but here it is all of a sudden, when I am sixty-seven years old. It is necessary to bear patiently that for which there is no remedy. Finally God wills it thus.

Patin apparently did not think that Colbert was responsible for the persecution of his son, for when Colbert was ill a few years later, Patin writes to Falconet, June 2, 1671:

For me I have a particular interest in his recovery, besides that he has often spoken well of me, and that he has raised my salary as royal professor, it is that I expect from it the liberty of my son Carolus, for although many persons have believed that it was he who had him persecuted, he has said several times, even of his own will (*même de son propre mouvement*), that it was not he. Thus we are reduced to knowing neither the accusation nor the accuser. But, as I have told you, I have good hope that this great minister will contribute to our happiness, in spite of the solicitations of our enemies.



GUY PATIN FROM "LETTRES CHOISIES." PARIS: JEAN PETIT. 1685.

On August 14, 1668, confirming a decree of the Châtelet previously issued March 25, 1668, Charles had been summoned before a special commission, for trial without right of appeal. The only charge formulated against him was that certain prohibited books had been found in his possession: "l'Anatomie de la Messe"; the "Memoire" published by Fouquet in his defense; and Bussy-Rabutin's "Histoire galante de la Cour," books which as his father says, were sold publicly by the booksellers of Paris. Guy Patin writes, "I think these three books are only a pretext and that there is some hidden party who is angry with my son and who is the cause of his misfortune." Bayle,[10] after quoting Guy Patin's explanations of his son's disgrace, says that they do not touch on the cause which was rumored about Paris as the true reason for his exile. It was said that Charles had been sent to Holland to buy up all the copies of a scandalous book, "Les Amours du Palais Royal," and burn them at once, not sparing a single copy. He was given this commission by a "Grand Prince," who promised to recompense him. Charles was said to have purchased the books but instead of destroying them he was accused of bringing them into France where they would, of course, be in great demand. Pic conjectures, without giving any very solid reasons, that he may have become involved in a love affair with some lady upon whom the King had bestowed his affections. He bases his supposition on the facts that Colbert, the all powerful minister, had taken an active, though secret part in his conviction, the majority of the judges having received *lettres de cachet*, ordering them to find him guilty, that Charles Patin never attempted even while living in security in foreign parts, to justify himself, and that in 1681 he was offered a full pardon by Louis xiv. Charles refused the proffered amnesty, saying "of what pardon would they speak to me? I did not know my crime."

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[9] Patin evidently hints at Colbert in these remarks. It is well known with what animosity Colbert pursued all those who sought to uphold the cause of his predecessor.

Pic recalls that Colbert had interested himself in the King's love affairs before, and that the trial of Charles Patin coincided in date with the advent to power over the King's affections of Madame de Montespan (1669), and that the pardon had been offered to him, without solicitation at the epoch of her displacement by Madame de Maintenon (1681). He thus accounts for the personal interest taken by Colbert and his royal master in the affair.

There does not seem much to support the idea that the exile of Charles Patin may have been due to a love affair. His wife followed him in his exile and apparently they lived with one another until parted by death, in perfect accord. There is another explanation for his persecution which seems more probable. In 1665, Denis de Sallo founded the *Journal des Savants*. Patin writes to Falconet (March 20, 1665):

> I do not know if you have received a certain kind of gazette, which they call the *Journal des Savants*, in which an author who complained against a little article of my son Charles, on the deal which was made here last year for the Swiss, is answered by him. I have sent you his answer, which is wise and modest. The new *Gazette* replied ignorantly and extravagantly, to which there had not lacked a strong and sharp response with good reasons, if they had not prayed Charles to suspend his reply, and menaced him with a *lettre de cachet*. The truth is that M. Colbert takes under his protection the authors of this journal, which is attributed to M. de Sallo, counseller in Parlement, to M., the Abbé de Bourze, to M. de Comberville, to M. Chapelain, etc., insomuch that Carolus is advised to delay his response, and even, by the advice of the premier president, who has also requested it (they say for a particular reason, to wit, that he does not stand well with M. Colbert since the process of M. Fouquet) . . . The republic of letters is for us, but M. Colbert is against, and if my son defends himself, they say they will send him to the Bastille. It would be better not to write.

This was not the only time that Charles Patin had been in trouble with the police for having in his possession contraband books. Pic's friend, M. Paul Delalain, discovered in the Bibliothèque Nationale the *dossier* of Charles Patin containing his sentence in 1668. Attached to it was the report of the arrest of both Charles and his father for an attempt to smuggle contraband books into Paris. They were bringing them into the city from Bourges, when their carriage was stopped and the two doctors apprehended and taken to the douane. Among the books were ninety-two copies of Rabelais, the "Lettres Provinciales," the *Journal des Savants*, "l'Histoire des Amours d'Henri IV," "Rome pleurante," "Le Roman comique de Scarron," and fifty copies of "l'Histoire amoureuse des Gaules." The latter, Guy Patin attempted to dispose of by throwing them down a latrine, but he was caught by the customs officers, and the books recovered by scavengers. There is no record of any punishment meted out for this offence beyond confiscation of the books.

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[10] Dictionnaire historique et critique—Art. Patin.

In 1666, Guy and Charles Patin were arrested for having in their possession contraband books.

Again in 1667, the elder Patin was in trouble for the same cause. Fifty copies of the works of Hofmann (Hofmann's "Opera Omnia") were found in his possession, and confiscated. "They were destined, not for presents, as he claims, but to be sold, according to his custom." After escaping from France, Charles Patin traveled and lived in England, Germany, Holland, Switzerland and Italy. He held several professional chairs at Padua, among them those of surgery and practice.

Patin was cheered by letters from Charles, showing that he had been well received in his wanderings, and was not greatly depressed by his banishment. Thus Patin writes to Falconet (September 13, 1668):

> I have had good letters from Germany. By them I learn that my dear son, Charles, diverts himself there in traveling, and visiting worthy men. He has lately been at Frankfort, where our good friend M. Scheffer received him very well, also M. Lotichius, M. Horstius, and other men of letters. He writes me that he studies, and that he does not afflict himself too much at quitting his country. *Securus sine crimine vivit*. The Elector Palatine wished him well, and invited him to dinner twice a week, and asked him to all the amusements of the Court. He has even offered to write to the King on his behalf, but Charles is a Stoic, who says he does not wish to owe his return to anyone but the King. He says he is a wise Prince. They have persecuted him in his name, but that he will cause him to return when he wishes. If that does not happen, I will say with Cayas and others, *O ingrata patria, non habebis ossa mea!* I have much more wish to see him than he has to return. My God, when shall it be?

Again Patin writes Falconet (April 26, 1669):

> My Carolus has left Heidelberg and has gone to see the Duke of Wurtemberg, who has demanded his medical aid. He has already made another journey there, with which he was well content, as the Prince was also with him, sending him away with handsome presents, and charging him to return soon to see him. He writes me that if he loved money he would have the occasion to be satisfied, and that besides his profession in which they honor him much (you know that which is the honorarium of physicians and lawyers), these princes love greatly to play at tric-trac with him and they willingly lose. He says they are the honestest players and best men in the world.

Charles published a little book of travels[11] which contains nothing indicative of any great erudition on the part of the author, reading more like the jottings of an idle dilettante than a work written by a learned antiquary.

In 1682, Charles Patin published a volume of "The Lives and Pictures of the Professors at the University of Padua,"[12] including his own life and portrait as Professor of surgery among them. This autobiographic sketch, however, is disappointing in that it throws no light on the reason for his exile. He relates with complacency the many honors he has received since leaving his native land, and expresses the happiness which filled his life at the time he wrote. He refers with affectionate respect to his father.

Patin writes Falconet (June 19, 1663) of

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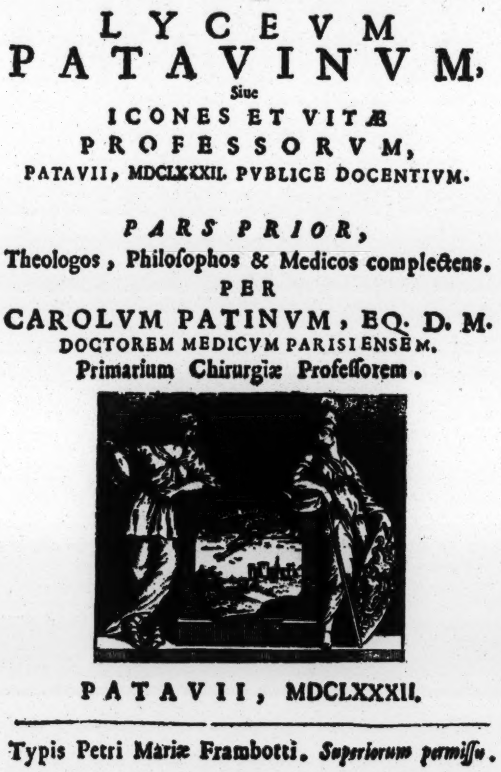
[11] Relations historique et curieuses de voyages en Allemagne, Angleterre, Hollande, Bohème, Suisse, par Charles Patin, Docteur en Médecin de la Faculté de Paris. Amsterdam, 1695.

[12] Lyceum Patavinum. Sive Icones et Vitae Professori. Patavii, MDCLXXXII. *Publice Docentium.*

Charles Patin's marriage, speaking as though he were doubtful of its success:

> I have married my son Carolus, aged thirty years, to the daughter of my colleague, M. P. Mommets. Her name is Madelon, and she is nineteen years less four months old. A beautiful girl, well born and well brought up by a good father and a wise mother, *Utinam omnia fauste succedant*. It is a bargain of which I am doubtful as to the success; *uxori atque viro est fatalis.*



LYCEVM
PATAVINVM,
Siue
ICONES ET VITÆ
PROFESSORVM,
PATAVII, MDCLXXXII. PVBLICE DOCENTIVM.

PARS PRIOR,
Theologos, Philoſophos & Medicos complectens.
PER
CAROLVM PATINVM, EQ. D. M.
DOCTOREM MEDICVM PARISIENSEM.
Primarium Chirurgiæ Profeſſorem.

PATAVII, MDCLXXXII.

Typis Petri Mariæ Frambotti. *Superiorum permiſſu.*

Title Page of "Lyceum Patavinum" by Charles Patin, 1682.

His wife and daughters were very learned and all published books on various subjects. Charles died at Padua on October 2, 1692.

PATIN AND THE BOOK TRADE

From the above it may be seen that Guy Patin though holding his head so high as a *docteur-régent*, was also a dealer in books to a very considerable extent. These commercial doings crop out with great frequency in his lectures. Whether he dealt in books to increase his income is doubtful. It would appear more probable that he was so intense a bibliophile that he could not refrain from handling them, whether in his library or in buying or selling. He seems to have enjoyed peculiar facilities for importing them and his activity in bringing foreign books into France was beneficent. He writes to Spon (September 17, 1649) about the efforts made by the syndic of the publishers to close the bookshops on the Pont Neuf. There were more than fifty of them, the privilege of opening them being sold by footmen of the King. Patin says they bought books stolen by children and servants and were a great annoyance to the regular trade. On several occasions Patin refers with commendation to the books of Primrose, a physician of Scotch extraction, who practiced at Bordeaux. His two chief books were "Exercitationes et anima versiones in librum, et motu cordis et circulatione sanguinis, adversus Guillelmym Harvaeum" (1630), and "de Vulgi erroribus in medicina." Primrose was one of the most virulent and obstinate opponents of Harvey.

Gaspard, or Caspar Hofmann of Nuremburg, another bitter opponent of Harvey's demonstration, was greatly admired by Patin, who published an edition of some of his works. Patin refers to him very frequently in terms of extravagant praise. When Harvey was traveling in Germany as physician to the Duke of Arundel he visited Hofmann at Nuremburg for the purpose of demonstrating to him the correctness of his views. Vesling, whom Patin also mentions with much admiration was yet another opponent of Harvey, basing his objections on the different color of the blood in the arteries from that in the veins.

It is curious to witness such an obsession on the part of a man whose intellect was as keen as that of Patin. As a professor of anatomy, we know that he performed dissections, or at least lectured on bodies which had been dissected by his prosector for him. He was not however an original worker, probably contenting himself with reading anatomy to his students either from Galen or some contemporary whom he admired, such as Riolan, and not troubling himself to follow up on the body any of the wonderful anatomical discoveries of men like Harvey, Pecquet or Bartholin, to ascertain whether they were true or not.

PATIN'S HEALTH

Guy possessed good health. The physicians of his time made their professional visits on a mule or on horse-back. Patin apparently did the latter; at least he writes to Spon (January 8, 1650) "that he had been out every day on horse-back," and there is no mention in his correspondence of his ever having suffered any very serious illness during the seventy-two years of his life. The only indispositions he mentions are the following: Writing to Spon (March 10, 1648) he tells him that he has been ill with a bad cold that finally required him to take to his bed and undergo seven bloodlettings; in another letter (March 7, 1651) he tells him that some years before, after drinking polluted water, he had passed blood and pus in his urine but that it had soon cleared up.

He writes Belin (May 10, 1653) telling him that he had always been a very moderate drinker and ascribes to this the fact that he does not yet need glasses, "notwithstanding my age and my vigils."

Patin was consistent in applying his therapeutic views to himself when he fell ill. He tells Falconet (June, 1661):

> I had a bad toothache yesterday, which obliged me to have myself bled from the same side (as the pain). The pain stopped all at once, as by a kind of enchantment, and I slept all night. This morning the pain began a little again. I had the other arm bled and was cured right away. I am, thank God, without pain. I think that these two bleedings will serve to enable me to purge myself surely, which I shall do next week, if I have the leisure for it.

Although he followed the ancient Greek and Latin medical authorities with blind faith, it is interesting to note Patin's freedom from belief in some of the traditional remedies of his day.

Thus he writes to Belin, fils (October 18, 1631), at a time when a pestilential disease prevailed in Paris, that he does not believe that theriaca, mithridates, alkermes, hyacinth, bezoar, or the unicorn's horn are of any use, because he does not think they possess any of the occult properties attributed to them.[13]

CAROLVS PATIN DOCTOR MEDICVS PARISIENSIS · ÆT · 29 · 1662

Charles Patin
(1633–1693)

Patin writes to Spon (February 4, 1650):

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[13] Theriaca, or treacle as his English contemporaries termed it, was regarded as an universal panacea against the bite of any venomous animal. It contained some sixty odd ingredients, among them bitumen, turpentine, saffron, and vipers. It was invented by Andromachus, one of Nero's physicians, and was in great vogue even as late as the eighteenth century. Evelyn in 1646 records in his "Diary" that when in Venice he went to see its preparation, "the making an extraordinary ceremony whereof I had been curious to observe, for it is extremely pompous and worth seeing." In both France and Italy, its manufacture was a long process attended with much ceremonial and many curious observances. The London Pharmacopeia for 1746 still retained it as official, as it also did mithridatum, an universal

The reputation of theriaca is without effect and without foundation, it comes only from the apothecaries who do all they can to persuade people to use compositions and would take from them if they could the knowledge and use of simple remedies which are more useful. If I were bitten by a venomous animal I would not trust in theriaca, nor in any cardiac, external or internal, of the shops. I would scarify the wound deeply, and apply to it powerful attractives, and only have myself bled for the pain, fever, or plethora. But by good fortune there are scarcely any venomous animals in France. In recompense we have Italian favorites, partisans, many charlatans, and much antimony.

THE PLAGUE AND SYPHILIS

The pest which Patin writes of in the letter above quoted was bubonic plague, as he says of it:

> There have been here since Easter a great quantity of malignant fevers, which have been so many hidden plagues, but one only names it the pest when one has seen buboes or charbons supervene, yet these diseases are not less contagious than the plague.

He complains that although there are two hospitals, Saint Louis and Saint Marçeau, in Paris, to which the plague-striken were sent, there is no physician attached to either hospital to look after the patients. Patin says that he had seen more then 60 cases of plague himself, and that there was not a physician of the Faculté who could say that since the month of July he had not "seen, found or discovered nearly every day someone who was not a victim of it, because it has been very common here."

He tells Belin (October 2, 1631) of the heroic action of a physician named Malmedy who in the plague visitation in 1582 and 1583 voluntarily shut himself in the plague hospital without pay. Patin adds somewhat spitefully, that nevertheless he made a great deal of money in the hospital and lived to enjoy his gains for twenty years after, when he died of "pure old age."

Patin in a letter to Spon (January 8, 1650) makes a statement which goes far towards confirming the views of those who hold that syphilis was not imported into Europe from America, but that it existed in the Old World, but was regarded as a form of leprosy. During the medieval period and down to the beginning of the sixteenth century, leprosy was so prevalent throughout Europe that most communities of any size had leper hospitals to provide for its victims. At the present time leprosy is practically extinct in Europe, but syphilis is universally prevalent. Patin writes: "The late Simon Piètre, older brother of Nicolas Piètre, two incomparable men, said that before Charles VIII in France, the syphilitics were confounded with the lepers, of which today our hospitals are for the most part empty."

Patin refers again to this confusion in the diagnosis between syphilis and leprosy in writing to Spon (May 11, 1655):

> It is not long since I was shown a patient, an Auvergnat, who was suspected of leprosy, perhaps because his family had the reputation to have had it among them, because there was no mark on his person. This made me think of some lepers here. In other times there was a hospital here dedicated to receive them in the Faubourg Saint-Denis, which is today occupied by the priests of the mission of Father Vincent (Saint Vincent de Paul). One sees them neither in

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antidote supposed to have been invented by Mithridates, King of Pontus, and made of nearly as many ingredients as theriaca. Alkermes or kermes was, as its name would indicate, a product of Arabic pharmacy. It was made originally from cocoons which were found on a species of oak tree. It was especially famous in the form of the confection of alkermes. Hyacinth was not made of the plant of similar name, but from precious stones, especially amethysts. The confection of hyacinth contained many other ingredients, such as other stones, musk, myrrh, camphor and various herbs. Bezoar stones were concretions found in the gastrointestinal tracts of various animals, especially goats, llamas, and antelopes. Its use came from the Arabs and it was supposed to be an universal antidote for all poisons. Unicorn's horn was generally made from the tusks of elephants or narwhals, although supposed to be derived from the fabulous unicorn. Paré had fully exposed the uselessness of bezoar and unicorn's horn, though Patin never refers to his memorable treatise.

Normandy, Picardy, nor Champagne, although in all these provinces there are leper hospitals which have been converted into pest hospitals, *Propterraritatem elephanticorum.* In other times they took syphilitics for lepers, *qui per inscitiam medicorum et sæculi barbariem, nec distinguebantum ab elephanticis, nec sanobantur.* Nevertheless there are still lepers in Provence, Languedoc, and Poitou. François Valleriola and Guilbert Ader assert it. Are there any in the Lyonnais? Have you seen any or recognized any as such? Have you in your city of Lyon a hospital for them? Have you seen them at Montpellier, or in any other places in Languedoc when you have been there?

OPPOSITION TO LAUDANUM

The introduction of the preparations of opium into practice undoubtedly led to considerable abuse of it at the hands of the incautious or unscrupulous. Its beneficent properties caused it to be hailed by many as the long sought panacea. The followers of Paracelsus were especially active in prescribing it often in harmfully large doses. It should be stated that the preparation which Paracelsus himself termed laudanum and recommended so highly, was not the tincture of opium to which we give that name today. The "laudanum" of Paracelsus was a gum or balsam called "ladanon," which was given in pill form. Patin, along with many of his contemporaries and those who came later, confused the terms and thought the Paracelsan remedy was an opiate. Patin, with his usual combination of conservatism and prejudice, condemned laudanum and all other preparations of opium with the utmost vehemence. Thus Michel Potier, in his works published in 1645, having commended opium and some of the "chemical remedies," Patin attacks him bitterly in a letter to Spon (January 20, 1645):

> I have heard said by M. Moreau, who was an Angevin like this Potier, that he was a great charlatan and a great rascal, who mixed in our profession, only showing himself on the stage to sell his wares better. He left the kingdom and made his way to Italy. Likewise he made himself in his book the Aristarch and censor of physicians. To hear him talk, it was he only that had knowledge and understanding. That which makes me suspect all he does is that he talks too often of his diaphoretic gold, of his opium or laudanum, and condemns too much the other remedies from which the people every day derived solace. His book is a continual censure of ordinary medical practice. Nevertheless there will always be fools who will admire him, and honest men will not gain any profit from him. This book will become ridiculous, or else it will render ridiculous all the profession of which we are part, you and I.

Æ 54
MEDECIN
CHARITA
I Picart incidit.
Guybert por ces eſcritz malgré les enuieux
Conſerue la ſante des Ieunes, et des Vieux.

FRONTISPIECE OF PHILIBERT GUYBERT'S "LE MÉDECIN CHARITABLE." PARIS: J. JOST. 1633.

OPPOSITION TO CINCHONA

Patin does not condemn quinine, which had been introduced into France under the name of Jesuits' bark, as bitterly as he does antimony and opium, but, being a novelty, he cannot approve it. He writes to Spon (January 30, 1654) that he had dined with Gassendi and had met at his table a M. Montmor, *maitre des requêtes.* This gentleman was a great collector of books and Patin was greatly delighted with him, especially when he intimated that he intended to employ him as his physician, but he adds that he has his doubts as to their according well together:

> M. Montmor has always loved chemistry and is not yet undeceived as regards antimony, and his wife also leans to these heresies; she is also for the Jesuits' powder, of which I have never seen in Paris any good effect.

On March 10, 1654, he writes Spon that the wife of de Gorris, one of his colleagues, had been found dead in her bed. She was sixty years old; "all winter she had suffered from a triple quartan fever, to cure which she had taken cinchona by which she thought she was cured. I think that this loyolitic powder (*poudre loyolitique*) shortened her days."

Imagine Patin thinking well of anything emanating from the Jesuits; could aught good come out of Nazareth? Patin writes to Falconet (December 30, 1653):

> This powder of cinchona has not any credit here. Fools run after it because it is sold at a very high price, but having proved ineffective it is mocked at now. I had treated a girl for a quartan fever so successfully that the access of fever was reduced to two hours only. Her mother, impatient, having heard the rumor made by this Jesuits' powder, purchased one dose for forty francs in which she had great hope because of the high price. The first access after this dose lasted seventeen hours, and was much more violent than any which she had had before. Today the mother has great fear of the fever of her daughter and much regret for her money.

The enlargement of the spleen, so frequently associated with malarial fevers, was recognized by Patin and his contemporaries, but the following extract from a letter to Falconet (September 21, 1661) will serve to illustrate the errors into which they fell because of the humoristic doctrine which dominated their views:

> But apropos of quinquina, it performs no miracle here. When the body is well cleaned out by bleedings and purgatives, it is able by its (own) heat to absolve or absorb the remainder of the morbific matter, at least for that purpose it is only necessary to heat it. Even those in whom the fever has ceased are not entirely well, because it returns unless they are well purged. The obstinacy and duration of these quartan fevers comes from the bad, almost carcinomatous condition of the spleen, which occupies its very substance. I have never given cinchona. I have seen those who have trusted to it too much hydropic. I would not purge at the access of a quartan fever, but I purge often at the end of an access, with much success. Even in great fever, I sometimes make them swallow four great glasses of laxative ptisan, containing senna. That makes the bowels open well, carries off a portion of the conjoined cause, and prevents the annoyance of the great sweats, of which they complain so often. As to bleeding at the commencement of the access, I never do it. It would be both imprudent and temerarious to do so.

ORVIETAN

Orvietan was a quack remedy much in vogue in Patin's time.

Patin writes Falconet (January 6, 1654) of a curious episode in the Faculté de Médecine in regard to it. He begins with a denunciation of de Gorris, a physician with a very large practice in Paris:

> All his life he has been of the evil party of the chemists, the charlatans, the Gazetteer, the foreigners, the men with secrets against gout, epilepsy and quartan fever; a very unfortunate practitioner who has killed many with the experiments he would make: Who knew truly much Greek and Latin, but who applied his knowledge badly, who never had the courage to resist the temptation of gold for any rascality or corruption of his profession. In 1647, a merchant of Orvieto, to sell his drug better, addressed himself to a man of honor, then Dean of our Faculté, M. Perreau, to obtain through him by means of a good sum of money which he offered him, the approbation of the Faculté for his opiate. He refused it with much dignity. The charlatan then addressed himself to de Gorris, who received from him a considerable present and promised him to get some doctors to sign an approbation of his medicament which he sold on the Pont Neuf, which he caused to be done by a dozen of others who were hungry for money. These were the two Chartiers, Guénault,

le Soubs, Rainssant, Beaurains, Pijart, du Clédat, des Fougerais, Renaudot, and Mauvilain. The Italian impostor, not content with such signatures, sought to have the approbation of the entire Faculté, and pressed the new Dean, who was M. Piètre, my predecessor, to make him give it to him, in the hope which he had to make a better sale of his drug if he should obtain that which he desired. The new Dean learned from the charlatan's own mouth all that de Gorris had done to him, and when he had assembled the whole Faculté, and recited the affair against these twelve Messieurs, they, having acknowledged their weakness and bad action, were expelled from the Faculté by a solemn decree. However they were reestablished on certain conditions, notably that of demanding pardon from the company in full assembly. No matter what they have been able to do since, the stain remains on them.

PATIN'S VIEWS ON INFANT FEEDING

Patin was a great believer in the nourishment of children by the maternal milk instead of on pap, which, as compounded in France at that time, was a mixture of wheat and flour, called *bouillie*. He thought that hand-fed babies were more subject to smallpox even in later life, and attributed his own exemption from that disease to the fact that he had been a breast-fed baby. He also thought that whooping cough, which seems to have been as prevalent in France in his time as it is in our own, was predisposed to or aggravated by the artificial feeding of children. He describes whooping cough in one of his own children, a little boy of three months, who had been taken out in very cold weather by his nurse. The illness lasted five weeks with paroxysms of cough lasting from a half-hour to three quarters, during which time Guy thought him in danger of suffocation. "Two bloodlettings, enemata, good breast milk, abstinence from pap, and keeping warm are the great remedies."

Patin's particular objection to the use of pap was that it was "a coarse food which causes much stickiness and obstination in the stomach and abdomen, and which pre-disposes to illness of a putrid nature." He adds:

> I hold pap a bad food, as much because of the flour which is not often sufficiently good, as because of the milk of the cow, which is far from the goodness of that of the breasts, which is taken entirely fresh and new, hot and spirituous by the child, whereas that of the cow is extremely weak in comparison, joined to which it is a gross, viscous food which makes a stickiness in the stomach of the child, and much obstination in its belly.[14]

He also says that smallpox was unknown to the ancient Greeks, and that children got no pap in their time.

In Patin's time human milk was much esteemed not only as a diet for children but also under certain circumstances for adults. Patin (April 1, 1650) writes to Spon that d'Esmery,[15] the Superintendent of the Finances is very ill, and that Valot his physician has put him on a purely milk diet. "In the morning he drinks ass's milk, at midday cow's milk, in the evening goat's milk, and in between the milk of a woman." The Duke of Alva, one of the greatest and cruellest generals of his time, in his old age had two wet nurses by whom he was nourished, and Dr. John Caius, the famous English physician who founded Gonville and Caius College at Oxford, was, when senile, fed in the same manner. Shakespeare hints at this in the "Merry Wives of Windsor," when the Dr. Caius of the play has as his nurse, Dame Quickly.

Patin advocated the drinking of ass's milk, a measure much in vogue in his time, in cases of debility or prolonged convalescence. When Falconet's wife was recovering from a serious illness, Patin writes (April 8, 1664), urging him to make her drink it. He quotes instances to show Falconet that drinking ass's milk is conducive to longevity:

> My mother-in-law, who died aged eighty-four years of an apoplexy, had drunk it for sixty years. The mother of M. du Laurens, the coun-

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[14] Letter to Spon, January, 1644.

[15] A creature of Mazarin's, his real name was Particelli. He was finally disgraced and replaced by Fouquet.

cillor, died last year, aged eighty-seven years, having used it ever since she was twenty-two years of age. Her sister-in-law, the widow of André du Laurens, the anatomist, had done the same and lived eighty-five years. It works marvels here, particularly in the spring and autumn, notably when taken with precaution. I only give it when the intestines are clean and prepared by good and gentle purgations.

VENESECTION IN INFANCY AND OLD AGE

It is hardly to be believed, but Patin asserts to Spon (August 17, 1658):

> We also bleed very fortunately children of two or three months, without any inconvenience. I can show more than two hundred of them bled at this early age. There is not a woman in Paris who does not think well of bleeding and that her child should be bled in the fever of smallpox, scarlet fever (*rougeole*) or teething, or in convulsions, so much have they seen of it by experience when they had them.

Patin writes Falconet (January 19, 1663):

> I bled another time an infant of three days for an erysipelas of the throat. He is still living, aged thirty-five years, a captain at Dunkirk, the son of Mademoiselle Choart.[16] I bled the son of M. Lambert de Thorigny the sixty-second day of his life, who is today ten years old. The application of great remedies at so tender an age demands much judgment.

The aged were also suitable subjects for profuse bleeding. Patin writes to Falconet (May 27, 1659):

> Our good M. Baralis has been bled eleven times in six days, which has prevented suffocation . . . But he is in great danger of not being able to escape it. A continued fever, a bad lung besieged with an inflammation, eighty-four years, are all signs which leave me with a gloomy suspicion. Oh! but it is a pity. He knows well his Hippocrates and Galen, and practiced medicine as a man of honor all his life.

THE USE OF ANIMAL REMEDIES

It is odd that Patin neither recommends nor condemns a class of medicines much in vogue in his time, namely those composed of animals or their secretions or excretions. Dr. Minivelle[17] gives the following list of those which the apothecary should keep in his shop, according to the "Pharmacopoeia" of Jean de Renou, published first in 1608 and again in 1637.

> One uses many entire animals, such as cantharides, centipedes, worms, lizards, ants, vipers, scorpions, frogs, crayfish, leeches and many small birds. As to the parts (of animals) our physicians hold assuredly and truly that they are endowed with many and admirable virtues, among which parts we can put the skull or the head of a man dead but not yet buried; the bone which is in the heart of a deer, the brain of antelopes, swallows and hares; the teeth (tusks) of the boar and the elephant, the heart of the frog; the lung of the fox, the liver of the goat, the intestines of the wolf; the genitalia of the deer; the skin and the slough of the snake. Item: fat of man, of the pig, of the goose, of sheep, of the duck, the rabbit, the kid, the eel, and the snake; the marrow of the deer, the calf and the goat; human blood, the blood of the pigeon, and of the goat; all sorts of milk and that which is made from it, as butter and cheese; the horns of the deer, and antelope and the unicorn; the toe nails of the eland, the goat and the buffalo; the shells of oysters and the pearls from within them, and the scales of many fish. Finally, since the excrements of the said animals have also their particular virtues, it is not unfitting for the pharmacist to keep them in his shop, especially the dung of the goat, dog, swan, peacock, pigeon, muskrat, civet, and the hair of certain animals.

SOME OF PATIN'S CONTRIBUTIONS TO LITERATURE

Patin edited a collection of discourses or harangues by Jean Passerat, professor of eloquence and Latin poetry in the Collège Royal, published in 1637, with a dedication to Charles Guillemeau, written by Patin. The edition of Fernel's "Pathology" (Fernelli Pathologiae), published at Paris in 1638, was prefaced by a dedication three pages long by Patin. Patin sometimes exhausts even his hyperboles in praises of Fernel. As a sample he writes to Falconet (March 29, 1656):

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[16] It was quite customary at that time to designate a married woman as mademoiselle.

[17] La Médecine au temps d'Henri IV.

> I am ravished that you should so greatly love our Fernel. That man is one of my saints, with Galen and the late M. Piètre. I told Madame de Riaut, the mother of your beautiful nun, that I would hold it a greater glory to be descended from Fernel than to be King of Scotland, or related to the Emperor of Constantinople. Fernel was good, wise and learned . . . never any prince did so much good to the world as Fernel has done.

Fernel, physician to Henri II, was a truly great man. He was interested in astronomy, and in 1527, he tried to measure the earth's size by observing the height of the pole at Paris; then proceeding northward until its elevation was increased exactly one degree, and ascertaining the distance between the stations by the revolutions of the wheels of his carriage, he made it 24,480 Italian miles in circumference.

About the middle of the seventeenth century a physician of Paris, L. Martin, published a translation of "The Regimen Sanitatis of Salerno" in burlesque verse, dedicated to Scarron. Some bibliographers have advanced that the real translator was Patin, but Réveillé-Parise thinks there is no proof of the assertion. An edition of this translation, published by Henault at Paris in 1651, is dedicated to Patin. Patin frequently refers to this translation, and in a letter to Spon (October 19, 1649) tells him that Martin, the author of the translation, has shown him some of the pages of the proposed work and intends to dedicate it to him.

Patin contributed considerably to various editions of the works of Jean Riolan, fils, adding tables and aiding in their correction for the press, and Triaire thinks it probable that he retouched his famous "Curieuses recherches sur les Écoles en Médecine de Paris et de Montpellier," published at Paris in 1651. Riolan states himself, his indebtedness to Patin for aid in his "Enchiridium anatomicum et pathologicum," 1648, which he dedicated to Patin.

Jean Riolan, the elder, who died in 1606, was Dean of the Faculté de Médecine from 1558 to 1559. His son, Jean Riolan, the younger (1577–1657) was professor of anatomy and botany at the Collège Royal, and physician to Marie de'Medici whose confidence he betrayed by spying on her actions for Richelieu. Although he denied the circulation of the blood and the existence of lacteal vessels and the lymphatic circulation, he made some advances, describing the fat appendices of the colon, naming the hepatic duct, and observing that the common bile-duct had but one membrane which served as a valve.

Triaire quotes from Tallemant des Reaux an amusing anecdote about Riolan. He was cut for stone in the bladder but some time afterwards had a recurrence, for which he refused to be cut again. His wife concealed Colot, the famous lithotomist, in the house. One day Riolan said he felt much better and thought he could stand the operation, and that he believed he would have himself cut if Colot were at hand. Thereupon, Colot appeared, and Riolan exclaimed that he could not have the operation; that he was not ready as he had not confessed. "All will fall on us," said Colot, "we will be damned for you, but you will be cut." He tied him up and cut him and then said, "Confess now, if you wish to." "No," said Riolan, "I am too well for that."

Patin often speaks with great admiration of the skill of the famous family of Colot. There were three of them who attained great fame as lithotomists. Patin, writing to Falconet (May 13, 1659), speaks of Janot, also a lithotomist of note, but not in Patin's good books, who had had the misfortune to lose three patients on whom he had operated. "The little Colot has cut many others who have recovered. I hope he will become as good and successful an operator as his father."

Stone in the kidneys or bladder seems to have been an exceedingly common complaint throughout Europe in the seventeenth century. Luther died of it, jestingly remarking that he was dying the death of Saint Stephen. Cutting for vesical calculus was a very common operation almost exclusively in the hands of a class of special operators known as incisors, among whom the most illustrious were the Colot family of whom Patin so often speaks. His own therapeutics in such cases was quite simple. In 1649 he writes Falconet, who was a sufferer, to refrain from wine, drink plenty of water, and be bled six times a year, and as often take a purge of cassia and senna with syrup of *white roses*. He tells him it is a disease of literary men, *litteratorum carnifex*.

Patin thoroughly endorses all of Riolan's arguments against the anatomical discoveries of Harvey, Pecquet, and the other anatomists who were establishing the science of anatomy. Writing to Belin, fils, October 8, 1655, he says that the good man Riolan "had just published his new book against Pecquet, the discovery of the *receptaculum chyli* and the chyliferous vessels," adding that all who have read it agree with Riolan and mock the others.

HONORS CONFERRED ON PATIN

When Riolan oppressed with old age and sickness, resigned his chair as professor in the Collège Royal, 1654, in favor of Patin, the latter writes Falconet (October 9, 1654) with pardonable pride and joy to tell him the good news. He is to teach botany, pharmacy, and anatomy. "I will direct all my care to make good scholars who should be far from the Arabs and the impostures of chemists, who are the ordinary persons by whom young physicians are today empoisoned."

He describes (March 2, 1655) his introductory address:

> It lasted a whole hour but it was not tiresome because it was a continuous history of the Collège Royal since the year 1529, when it was founded by François I, by whose successors the institution has been maintained, and governed by the grand aumoniers of France. Then I talked of the former professors who had rendered the Collège illustrious, such as Danesius, Turnebus, Carpentarius, the Durets, the grand Simon Piètre, and those who are yet living, as M. Riolan, to whom I testified my gratitude for having chosen me as his successor. I saw there some white monks and even four children of the fortunate Père Ignace, I know not how they came there without being invited. One of our physicians just told me he had returned from the College of Cambrai yesterday with one of our antimonial companions, from whom he demanded what he thought of my harangue. The doctor answered that the Latin of it was good, but that there was too much idle talk in it, that I had deceived him as he had expected that I would talk against antimony, but that I had said nothing about it.

In 1655, Patin was offered a professorship at Boulogne, with a salary of 2,000 écus, and the opportunity of acquiring a large practice in that city. He declined, and writes Falconet (September 21, 1655):

> Neither ambition nor the desire to become rich shall make me quit Paris. Five years ago I declined to go to Sweden with much better conditions. I am cured of the *perigrinomanie* and the *philargyrie*, or rather I have never been sick with them.

In 1658, the Ambassador of Venice asked Patin to go to Venice promising him a salary of 6,000 francs a year from the Senate of the Republic, and the prospect of acquiring a large practice. Patin says that his name was suggested to the Ambassador by de Gorris, one of his pet aversions. He declined the offer on the ground of his health and his desire not to leave Paris. The Ambassador then offered to give the appointment to his son, Robert Patin, but Guy would not hear of his accepting it, stating that it was necessary for his son to study five or six years more with him before he would be qualified to fill the position. He writes Falconet, "Italy is a country of syphilis, poisonings, and atheism, of Jews, renegades, and the greatest rascals in Christendom, all there is monkery and hypocrisy."

Patin also received an invitation to go to Denmark. He writes Falconet (May 4, 1663):

> M., the Prince of Denmark and M., his Ambassador, wish to take me from here, and bring me to that cold country. They have written to their King, and he has charged them to take me. They have made me beautiful offers, but I do not wish it. I am neither to be sold nor bought. I wish to be buried at Paris near my good friends.

The premier president of the court of the Parlement of Paris, Lamoignon, was a great personage, and Patin writes Falconet (May 20, 1659) with evident pride:

> I supped last Saturday with *M. le Premier Président*, where he made a great cheer. One eats quickly with him and talks little during the repast. He wished however, that I should drink his health twice in Spanish wine, which was extraordinarily good. Afterwards I talked with him a good hour and a half on various things in which he took great delight. He told me he was in difficulty how we should manage in the approaching summer, that he had wished to have leisure to talk with me once a week, an entire *après-dîner*, and that he feared, for lack of leisure, he would forget the little he had learned. Two *maîtres des requêtes*, who had come there to sup because of me, brought me away in their *carrosse*. He told me in parting that he had a design to make at his house a little academy, at least once a week, but he did not wish we should be more than six. He signified that I should be one and I believe my son, Carolus, will be of it also, because *M. le Premier Président* wishes as much good to him as to me.

It has been asserted, but without proof that the premier president used to have a louis placed under Guy's napkin each time that he was his guest. Patin, naturally, makes no mention of it, and the story seems to have been mere gossip.

Patin writes to Falconet (February 19, 1659):

> *M. le Premier Président* sends for me sometimes to sup with him. He gives me great cheer, but his good welcome I value more than all the rest. I have promised to sup with him every Sunday in Lent, and later we will take other measures, according to the season. There is much pleasure with him, because he is the wisest man of the long robe (lawyer) in France. He is very sage and very civil and says, smiling, that it is needless to speak evil of the Jesuits and the monks, nevertheless he is ravished when some *bon mot* against them escapes me.

Patin seems to have been a popular lecturer; at least his lectures were well attended. He writes to Spon (April 21, 1655):

> I gave my first lecture today in the great hall of Cambrai. I had fifty-two scholars who took notes, and some (other) auditors . . . The same day when I gave my second lecture at Cambrai I had by actual count sixty-two auditors. As I saw that they enjoyed listening to me, I made my exposition last an entire hour, and went forth with great applause.

In 1657, he writes Spon that his first lecture was attended by ninety persons and his second, by one hundred and fifty.

Patin was on terms of intimate friendship with Pierre Gassendi (1592–1655) whom he terms "an abridgment of all the moral virtues and of all the great sciences." He also calls him one of the most honest and learned men of the day in France. Gassendi was a priest and was chiefly distinguished as a philosopher and mathematician though he was also a good anatomist.

PATIN'S OPINION OF PHYSICIANS

Charles Saumaise (Salmasius) was a great source of admiration to Patin, who terms him that "excellent and incomparable personage" in a letter to Spon (October 26, 1643). Saumaise was born in 1588, and died in 1658. He was not a physician but a philosopher and theologian. Like most of the savants of his time he dabbled occasionally in medical matters. To English readers he is most familiar as the antagonist of John Milton in a pamphlet war, in which Saumaise supported the Stuart cause. He was a Huguenot, but nevertheless Richelieu sought to attach him to his services.

Patin was greatly wrought up by hearing the statement made that Saumaise had spoken ill of physicians, so he writes to Spon[18] that he has searched the writings of Saumaise to discover the place where he did so. He discovered that in writing of Attic and Roman law, Saumaise had referred to physicians as being mercenary. Patin says he is wrong to do so because on several occasions when Saumaise had been ill in Paris, he had been attended by physicians who, after saving him from the hands of a charlatan into which he had fallen, had declined to accept any pay for their services to him. He attributes the statement made by Saumaise to the fact that he had lost three children in one year, of smallpox, while living in Holland, due, thinks Patin, to the "rude and gross" methods of practice prevalent among the physicians of that country.

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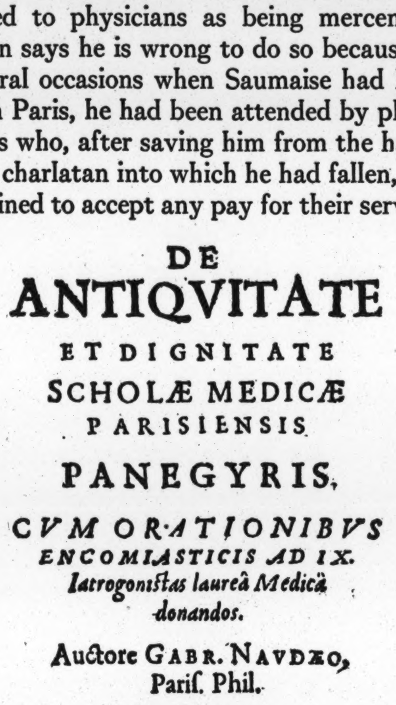
[18] September 12, 1645.



DE
ANTIQVITATE
ET DIGNITATE
SCHOLÆ MEDICÆ
PARISIENSIS
PANEGYRIS,
CVM ORATIONIBVS
ENCOMIASTICIS AD IX.
Iatrogonistas laureâ Medicâ
donandos.
Auctore GABR. NAVDÆO,
Parif. Phil.
Diuitijs animoſa ſuis.

LVTETIÆ PARISIORVM,
Apud IOANNEM MOREAV, viâ Iacobæâ,
ſub ſigno Globi Cæleſtis.
M. DC. XXVIII.
CVM PRIVILEGIO REGIS.

TITLE PAGE OF "DE ANTIQUITATE" BY GABRIEL NAUDÉ, 1628.

He is astonished that Saumaise should have expressed such an opinion. He adds that he only augments the number of those who have done so, of whom Pliny is chief.

As to Michel de Montaigne, of whom I make great case, he has honored doctors by his approbation in their persons, and has only attacked their profession; and nevertheless he has been too hasty; if he had had ninety or one hundred years before condemning medicine, he would have had some color of reason, but having been sickly from early youth, and having lived only seventy years[19] it is necessary to acknowledge that he paid the debt too soon; wise travelers only mock the dogs of the village after they are got to a distance, and when they cannot be bitten.

Patin's own cynicism about members of his profession is shown in the following passage:

> I will say, to the shame of my art if the doctors were only paid for the good that they actually do, they would not gain so much, but we profit from the foolishness of women, from the weakness of sick men, and from the credulity of everybody.

Yet he writes Falconet (November 4, 1650):

> I will never speak insultingly of a doctor of medicine, because of the honor I bear to the profession, but I avow to you that all the chemists (van Helmont, Guénault, etc.) that I have known until now have been poor vagabonds, boasters, braggarts, and liars, or very ignorant impostors.

Patin refers again to those who have written against physicians in a letter to Spon (October 19, 1649), mentioning that among those who had done so were the elder Pliny, Montaigne, and Agrippa. But he says that in the month of February, 1617, the cold was so intense that his father and mother took him home from College, as they feared he would not be as warm there as by their fireside.

> I remember that this little vacation was very agreeable to me, and being near a great fire much to my comfort, where the wood cost nothing, I read nearly all of a folio among the books of my late father, which was the "Commentaries" of Blaise de Montluc . . . He cites pests, plagues, and declaims therein very rudely against the great number of physicians, advocates, and procurers, whom he calls the

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[19] Montaigne died when only fifty-nine. He was born in 1533 and died in 1592.

vermin of the palace . . . A gentleman named Rampole made here an academic discourse in which he extended himself greatly against the inutility of a very great number of men of letters in a state, wherein he spared neither physicians nor others. I avow veritably that there are in France too many priests, monks and ministers of chemistry, I mean procurers and lawyers of all kinds. I do not even doubt that in the country and in the small towns there are too many physicians, and that many of them are very ignorant. In Amiens, which is a small city desolated by wars and the passage of armies, there are today twenty physicians. But those of whom there are undoubtedly too many in France are the monks and the apothecaries, who cut miserably the purse and throat of many poor people. In recompense there are very few good and wise physicians who have been well educated and taught. I see them even here, *qui malunt errare quam doceri*, although they have good means to amend themselves. As to the country, it is overrun with miserable physicians, *qui de se nihil nisi magnifice sentiunt*, because they have dipped their noses in Perdulcis, of whom they only understand half the terms, or they have heard tell of diamargaritum, of apozemes, of cordial juleps, and of *vin èmètique*. The principal cause of this misfortune is the too great ease with which the little universities make doctors. They give parchments too easily for money at Angers, Caen, Valence, Aix, Toulouse, and Avignon. It is an abuse which merits punishment since it redounds to the detriment of the public, but by misfortune we are not in a state of amendment . . . But perhaps God will finally have pity on us, and will change these things.

CONTROVERSY WITH RENAUDOT

Among the most interesting controversies in which Patin engaged was the famous one between Théophraste Renaudot, "the gazeteer," and the Faculté de Médecine. Renaudot presents an interesting character study as a quack whose intelligence led him to institute really big things, though it is very open to question, whether he himself realized their utility, and he certainly could not have anticipated their subsequent developments. Born at Loudun about 1586, he received the degree of Doctor of Medicine at Montpellier in 1606. He became acquainted with the famous Joseph François Leclerc, Marquis de Tremblay, more generally known as Père Joseph, a Capuchin monk, who was Cardinal Richelieu's right hand man and the only human being in whom he seems to have had implicit confidence. Renaudot went to live at Paris, in 1612, with the strongest recommendations from Père Joseph to Richelieu. These led to the latter procuring for him the appointment of physician-in-ordinary to the King, Louis XIII. He became a favorite of Louis, and speedily procured the royal authority, backed by a decree of the Parlement of Paris, to establish a *bureau d'addresses*, or sort of employment agency, to which he added a pawnshop, or Mont-de-Piété, where money was advanced on the salaries of the borrowers, and also a free dispensary, or *consultations charitables*, all of which establishments are fully described in a pamphlet entitled "Inventaire de bureau de rencontre où chacun peut donner ou recevoir avis de toutes les nécessités et commodités de la vie et société humaine," published at Paris in 1620. The following year he began the publication of a newspaper, *The Gazette*, the first French newspaper.

Readers of Cyrano de Bergerac will recall the scene in the second act in the restaurant of Ragueneau, when the crowd is overwhelming Cyrano with congratulations on his victory over his hundred assailants at the porte de Vesle. He is approached by a "man of letters" with a writing case, who asks him if he can have the details of the contest. Cyrano repulses him, whereupon his friend Le Bret tells him: "He is Théophraste Renaudot! the inventor of *The Gazette*."

> Cette feuille ou l'on fait tant de chose tenir!
> On dit que cette idée a beaucoup d'avenir!

Those of us who are interested in Guy Patin can only express our regret that the great French poet did not see fit to make him likewise a figurant with his antagonist.

He shortly afterwards ran foul of the

Faculté de Médecine by attempting to establish, with the connivance and assistance of the doctors of Montpellier and the apothecaries, a rival school of medicine. The attempt was fraught with danger to the eminence of the Faculté, and they at once entered upon a fierce struggle with the audacious Renaudot, who, backed by the formidable friendship and favor of the King and Cardinal, put up a good fight. The death of Richelieu on December 4, 1642, was fatal to Renaudot's chances. In March, 1643, Patin wrote to Spon that "he had folded his baggage" since the death of his chief support. In the same letter he refers contemptuously to a recent publication of Renaudot's "La présence des absents, ou facile moyen de rendre présent au médecin l'état d'un malade absent. Dressé par le docteur consultant charitablement à Paris, pour les pauvres malades" in which he discourses on a method of treatment by correspondence which he had organized and which as Triaire remarks has certainly not been equaled by contemporary charlatans, nor, we might add, by the Christian Scientists.

Before his death, Richelieu had accorded to Renaudot a large amount of land in the Faubourg St. Antoine, ostensibly for the *consultations charitables*, but Triaire states that the ground was really intended for the purposes of the school of medicine which Renaudot proposed to found in opposition to the Faculté de Médecine. The Cardinal hated the University of Paris because it possessed certain rights and privileges which were in opposition to the royal power.[20] Because its professors and students were often not amenable to the despotic power Richelieu wished to wield, Triaire thinks that the Cardinal backed Renaudot in his scheme with the deliberate purpose of destroying or, at least, lessening the power of the Faculté de Médecine. This explains the extreme animosity of the physicians toward Renaudot and the ardor with which they pursued the fight against him. The contest was not just with a successful charlatan, but against the despotism of the all powerful Minister, and it is little wonder that we find Patin breathing a sigh of relief at Richlieu's death, "il est en plomb, l'éminent personnage."[21]

In a letter to Spon (March, 1643) Patin again joyfully refers to the great man's decease. "The Gazeteer is living with Guillot le Songeur since the death of his inspirer (protocale) who held him up against us. But, God be thanked, he has folded his baggage."

Il est en plomb, l'excellent personnagé
Qui a nos maux a ri plus de vingt ans.

Patin writes to Spon[22] some details of the last illness and autopsy of Richelieu. The Cardinal died on December 4, 1642, after only six days of acute illness, though he had been very feeble and in poor health for a long time. During the preceding summer he had been in the south of France busied in suppressing the insurrection of Cinq-Mars. He returned to Paris in a litter on October 17th. While absent he had been operated upon for an abscess of the rectum. Patin says that a few days before Richelieu's death, in desperation he had submitted to the ministrations of a female empiric, who had given him horses' dung in white wine, and that another charlatan had given him a pill containing opium, because he did not think that the treatment by his regular physicians had been after the most approved manner. Triaire[23] quotes from a contemporary account of Richelieu's last days:

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[20] Among other privileges claimed by the Faculté de Médecine of Paris, was that of exemption from military service. In 1634, the Spanish and German armies invaded France and succeeded in capturing Corbie, only thirty-three leagues from Paris. The country rallied patriotically. All the great bodies of the state subscribed to the fund raised by Paris, which also raised 28,000 men. The Faculté gave 1,000 écus. Patin writes to Belin, August 29, 1636, that the Faculté de Médecine claimed its exemption from military service on account of exemptions often confirmed in its registers. He adds that he himself has subscribed 12 écus to the fund raised by the Faculté.

[21] This is a quotation from a rondeau written by Miron which Triaire gives:

"Il est passé, il a plié bagage,
Ce Cardinal, dont c'ést moult grand dommage,
Pour sa maison. C'est comme je l'entends;
Car pour autrui, maint hommes sont content;
En bonne foi, et n'en voie que l'image,
Sous sa faveur il enrichit son linguage,
Par dons, par vols, par fraude et mariage,
Mais aujourd'hui, il n'est plus le temps,
Il est passé.
Or, parlerons sans crainte d'être en cage.
Il est en plomb, l'éminent personnage
Qui de nos maux a ri plus de vingt ans."

[22] December, 1642.

> November 28th the Cardinal was taken with a violent chill and pain in the side. Bouvard summoned, bled him twice in the night of Sunday or Monday, but the patient spat blood and his fever increased. From Monday to Tuesday the pain having augmented, they practiced two new bleedings. Tuesday, December 2nd, a consultation was held at which it was decided to make a new emission of blood, and to have recourse to purgatives. The fever having redoubled in the evening they made two more bleedings. On Wednesday, December 3rd, an empiric of Troyes named Lefevre, was called in and administered a pilule which seemed to give a little relief. Finally, Thursday, December 4th, the seventh day of the illness, the Cardinal was seized with cold sweats, and died at noon.

At the autopsy the brain was found to be of unusual size.

It is curious how frequently autopsies were performed at that time. Patin's letters describe many of them. Pic[24] conjectures it was because of the frequency with which the deaths of prominent personages were ascribed to poisoning, but this seems doubtful as they were performed in many instances in cases where no such suspicion could have been entertained. This may have been the reason that the bodies of the Kings of France were always subjected to an official post-mortem examination, but would hardly suffice to explain the frequency of the examination of the bodies of private individuals.

Richelieu was a dangerous antagonist. The war was conducted chiefly through the medium of virulent pamphlets. As Patin writes to Belin in May, 1641, if "the Gazeteer," as he terms Renaudot, had not been sustained by his Eminence, the Faculté would have instituted a criminal process against him, but it would have been doomed to failure against such influence. Michel de la Vigne, Moreau, Riolan, Patin and other members of the Faculté wrote tracts in which Renaudot was excoriated and held up to contempt. Richelieu ordered them to cease.

Renaudot seems to have been particularly stung by the attacks of Guy Patin, who had termed him "nebulo" and "blatero," a nebulous braggart. He had Patin summoned before the *Maitre des requêtes*, and it is sad but true that Guy only extricated himself from the charge of libel by asseverating that the terms as he used them were intended to be applied to Guy de la Brosse, the founder of the Jardin du Roi, and not to Renaudot. The latter, not to be thwarted, got a sister of de la Brosse, who was dead, to sue Patin before the *Juges de requêtes de l'Hotel.* At the trial of the process Patin distinguished himself by addressing the court in his own behalf for hours, "with an eloquence, erudition, and esprit" which made the judges marvel.

They gave judgment for Patin on August 14, 1642, and needless to say he was greatly elated at his triumph. The Faculté proceeded actively against Renaudot, after he was deprived of his powerful protectors, the King and Richelieu. They took the matter up before the Châtelet, accusing Renaudot of practicing medicine illegally, and procured an order by which Renaudot and his associates were commanded to cease their enterprises. Renaudot appealed to the court of the Parlement of Paris, which august body on March 1, 1644, also rendered a verdict against him. Thenceforth, he passed into obscurity and no longer troubled the repose of the Faculté.

One method of expressing his contempt of Renaudot which Patin used, appears somewhat undignified as well as laborious. On September 17, 1643, Patin caused a Bachelor of Medicine named Courtois to sustain before the Faculté, a *thèse* which Patin had written, "Est-ne totus homo a natura morbus" (Do the maladies of man all come from nature?). It had a great success, six editions being printed. In a letter to Spon, December 24, 1643, he tells him that he has sent him a copy, and directs his attention to a passage where, in writing of diseases of the nose, he will find after the word *nebulones* the name of Renaudot, by taking the first letter of each word of the eight following. I give the transcription of the passage as illustrative of a far-fetched seventeenth century witticism:

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[23] Lettres de Guy Patin, footnote, I, 155.

[24] Guy Patin.

"Corruptum nasum sequitur corruptio morum; existo enim masonum genere, qui, ancidulo ore loquuntur, nebulones sunt, Ridiculi, Effranaei, Nefarii, Ardeliones, Vafri, Dolosi, Absceni Turbulenti, mendaces, maligni, invidi, quadruplatores, flagitiosi, infames, contumeliosi, faccinorosi."

Writing to Spon (1650) of his great admiration for the poems of Ovid (Ovidius Naso), he says:

> Ovid was a *bel esprit* and I would willingly reread his works if I had the time. For his surname Naso it pleases me by the sympathy which I have for the big nosed, and the hatred I bear to the flat (camus) which are nearly all stinking and filthy, as "The Gazeteer," Théophraste Renaudot, against whom I gained the beautiful process on August 14, 1642. Thus I remember in going forth from the Palace (*palais de justice*) that day, I approached him, saying, "M. Renaudot, you can console yourself because you have gained in losing." "How then?" said he. "It is," said I to him, "because flat nosed when you entered here, you are going out with a foot more of nose."[25]

Renaudot responded to Patin's personalities by equally sharp replies. Because of the fact that Patin confined his therapeutic measures almost entirely to bleeding (*la saignée*), syrup of roses and senna, he was nicknamed "Doctor Three *Ss*."

Renaudot refers to this in the following epigram:

Nos docteur de la Faculté,
Aux malades parfois s'il rendent la santé,
Ont besoin de l'apothicaire;
Mais Patin s'en dispense et, plein de dignité,
Avec trois S les enterré.

Patin[26] tells how the Faculté scored on "The Gazeteer" in one instance. A rich old abbé, who was one of Richelieu's attendants, had been attended by Renaudot during an attack of gout. Renaudot gave him a powerful purgative which aggravated his attack. The abbé discharged him and put himself in the care of a member of the Faculté, who cured him. The old gentleman felt so grateful that he gave the Faculté 10,000 écus towards rebuilding. Patin writes: " 'The Gazeteer' from whom this prey has escaped has too good a heart to break over it, but however, I do not doubt that he is much vexed."

Renaudot was obliged to give up his *consultations charitables*, his project for a college of medicine and his pawnshop, but permitted to contine his *bureau d'addresses* and *The Gazette*. He died on October 25, 1553. His two sons, Isaac and Eusebius, both became members of the Faculté de Médecine, but only after a decree of the Parlement of Paris in 1642 had ordered their admission, which order was not complied with by the Faculté until 1647 or 1648. They continued to publish *The Gazette*, but before taking the oath required for the doctorate, were obliged to give up the *bureau d'addresses* and disavow the conduct of their father, in an oath taken before a notary.

(*To be concluded*)

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[25] The French have a proverbial expression applicable to one who is humiliated or chagrined that he has received *un pied de nez*.

[26] Letter to Spon, March 28, 1643.

ROBERT TALBOR, MADAME DE SÉVIGNÉ, AND THE INTRODUCTION OF CINCHONA

AN EPISODE ILLUSTRATING THE INFLUENCE OF WOMEN IN MEDICINE

By GEORGE DOCK, M. D.

ST. LOUIS, MO.

BOOK collectors, like prospectors, game hunters and gamblers, sometimes experience coincidences that show how, in predisposed minds, faith in portents, dreams, guiding Providences or the divining rod may be established. Among several personal incidents fo this kind, the finding of a certain little book is one of the most striking. In the summer of 1901 I was in London, and, for reasons not necessary to state, was avoiding old book shops. Walking down Shaftsbury Avenue one day, however, I withstood the temptations of the antiquaries that then lined that street until I came even with a window of a small shop that had lying on its one shelf about a dozen books equally inconspicuous and without legends or announcements of any kind. I walked through the open door and picked up a volume at random. As soon as I opened it, I saw the book was by one of the numerous romantic figures in medicine. It was a book I had long known of but had never seen. I looked over the others, and found nothing of interest; the first I picked was the only one on a medical topic. The price was so low that my scruples vanished, and I walked down Piccadilly with the same sort of feeling a Henry Huntington might have when he has acquired a Gutenberg Bible or a "Rape of Lucrece."

Madame de Sévigné
(1626–1696)

The book is the "Pyretologia" of Robert Talbor, printed in 1672, the full title being: "A Rational Account/ *of the/ Cause & Cure of/ Agues,/* with their *Signs/ Diagnostick & Prognostick./ Also/* Some specifick *Medicines/* prescribed for the Cure of all/ sorts of *Agues;* With an account of a successful Method of the Authors/ for the Cure of the most Tedious and Dangerous *Quartans./* Likewise some *Observations* of/ *Cures* performed by the aforesaid Method./ Whereunto is added/ A short Account of the *Cause* and Cure of/ *Feavers,* and the Griping of the *Guts,* agreeable to Nature's rules and Method/ of Healing./ Author Rto Talbor Pyretiatro./ Non multa, sed multum./ London, Printed for *R. Robinson,* and/ are to be Sold at his Shop near *Greys Inne* Gate in *Holburn,* 1672."

In order to realize its bibliographic value one must know that the library of the Surgeon-General's Office contains no copy (May, 1922); the only other one known to me being in the British Museum.

It is a 16 mo. of 8 + 77 + 4 pages; the text measuring $4\frac{7}{16} \times 2\frac{1}{16}$ inches, with catchwords. The paper is of fair quality, the type plain Roman and Italic of the period; the typesetting and printing inferior.

To understand the intrinsic value of the book it is necessary to turn to the history of the use of cinchona bark. The early history of this in its home in Peru is so wrapped in legend that the inquisitive Humboldt could not unravel it. The actual history begins at the earliest in 1632, when the Jesuits first sent the bark to Spain, but did not exploit it until 1638, or 1640, when the Countess of Chinchon, wife of the viceroy of Peru, was cured of ague by the bark. Soon afterwards, 1643, the General Procurator of the Order of Jesus, Cardinal de Lugo, made known the merits of the powder on a tour of France, and after that, under the name of Jesuits' or Cardinals' powder, the sale was actively promoted by missionaries of the Order, who developed a lucrative trade, which probably reached its height about 1649, when a large supply was distributed by the Jesuits. In 1653 failure to cure the Archduke Leopold of Austria caused a temporary lull in the use of the powder. In 1655 it was introduced into England under the names of Jesuits' powder, fever bark, Peruvian bark, etc. A violent epidemic of malaria that occurred in England soon afterward gave plenty of opportunity to use the remedy. In 1666 Sydenham first published his "Methodus Curandi Febres" in which he described the use of the bark, but in this and the edition of 1668 he spoke briefly and not very favorably of the drug. In 1676 he was more definite and in the preface spoke of the bark in malaria as a specific like mercury and sarsaparilla in syphilis. By medical historians he has usually been credited with establishing the remedy, by putting its application on a sound and clearly described basis, and in medical literature he is often compared with Talbor to the disadvantage of the latter. On the other hand it has been said that Sydenham owed his knowledge to Talbor. This question cannot be settled, but one thing seems certain; in the words of Latham," what Sydenham gave away, Talbor sold." The "Medical Observations" contain much interesting material on the natural history and treatment of malarial diseases.[1]

According to the "Dictionary of National Biography," Robert Tabor, Tabord, Talbor or Talbot, was born about 1642. He was apprenticed to a Cambridge apothecary (Gideon Harvey called him a "debauched Cambridge apprentice"). Publishing his "Pyretology" in 1672, he soon became famous, notwithstanding opposition—perhaps on account of it. According to Edward Sheffield, Marquis of Normanby, he was lucky enough to save the life of Charles II when threatened with ague. Richard Lower had refused to sanction the cinchona treatment. By the intervention of Thomas Short, Talbor was permitted to make the experiment and was completely successful. In consequence he was appointed one of the King's physicians in ordinary and was knighted at Whitehall in 1678. According to the common account, Charles recommended Talbor to Louis XIV when the Dauphin was ill with ague. The usual reference to Evelyn's "Diary" is dubious, because the story was told in 1695 or sixteen years after the event, and in one of the latest editions of the diary, Talbor is called Tudor. The *Gazette* of September 23, 1679, says just before this date Charles had some paroxysms of fever, and that on the 15th he had taken the remedy of the Chevalier Talbot and recovered perfectly.

Some account of the "Pyretology" may now be given. It is dedicated to certain "citizens and the rest of those worthy persons who have been my patients," and in the dedication anticipates the objections likely to be raised. In the preface the author says that having failed to learn anything about agues in the books, he "planted himself in Essex in a place where agues were epidemic diseases." Living there some years he "attained to a perfect knowledge of the cure of the most inveterate agues."

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[1] Sydenham Society Edition, Vol. I.

The introduction begins with Adam and his pharmacologic knowledge, unfortunately lost in the "Fall," goes on to a reference to the doctrine of signatures, the ibis and the invention of clysters, the "sea-horse in Nilus" and bloodletting, and the development of empirical medicine. Then follows a physiologic excursion into the functions of the spleen and stomach, the "Duumvirate of van Helmont, whose defects give birth to all internal diseases." Chapter II discourses on the cause of intermitting fevers or agues, namely obstructions in the circulation, with ebullition. In this chapter we learn of the vomiting of "ague cakes." Chapters III and IV deal with the diagnosis and prognosis of agues. In Chapter V the cure is considered, especially with drugs used before cinchona, such as *Crocus metallorum*, myrrh and aloes, carduus benedictus, salts of tartar and laudanum. In Chapter VI charms are discussed, briefly described as either "words of no sense, which disturb not the imagination; or words of similitude, that humor and feed the imagination; or scripture words, which out of a conceit that such texts and words have power, do strengthen the imagination." On page 42, in Chapter VII, the author begins to set forth his particular method of curing all sorts of agues. This is done in so obscure a manner as to be incomprehensible and includes a warning against Jesuits' powder, "as it is given by unskilful hands."—"Yet is this powder not altogether to be condemned." The usual impression of the reader must have been very different from that given by Sydenham. Chapters VIII and IX deal with the diet to be observed during a cure. A few cases are cited briefly. The following pages, more than twenty, have little to do with ague or bark.

The book, therefore, small as it is, makes perfectly clear the charlatanism of the author, and frees Lower from any suspicion of narrow antagonism.

The stock bibliographies tell that Charles II sent Talbor to France to treat the Dauphin. The French expedition is mentioned in many biographies, letters and newspapers, but it is impossible to derive from them a connected story of their relation. According to La Fontaine, Talbor came to France with letters of recommendation from the Duchess of Mazarin. In the letters of Madame de Sévigné, one can find details that suggest a simple explanation—the puffing of a real or supposed healer by clever and influential people, chiefly women and ecclesiastics, until he was forced into the medical notice of the highest social set of the period, and then was successful in converting no less powerful a monarch than the "Sun King" himself, and from him obtained honors and riches. In order to give some idea of this part of the story, I must begin with a description of my chief authority.

Madame de Sévigné, born in 1626, and named Marie de Rabutin Chantal, was the daughter of a brilliant and reckless nobleman, one of the finest examples of a witty and profligate age. Orphaned at the age of seven and brought up by her uncle, Christophe de Coulanges, Abbé of Livry, she was distinguished from her childhood by her beauty, especially that of her hair and complexion, and all her later life by her vivacity and energy and her devotion to her friends. Her affection for, and interest in, her daughter make her the more conspicuous. The Marquis de Sévigné, whom she married at the age of eighteen, was chiefly noted for his extravagance and his love affairs. The most celebrated of these was with the marvelous Ninon de l'Enclos, and he was killed in a duel over another woman known as "La Belle Lolo." "Left a widow at twenty-five, and more beautiful than ever, the marquise never married again despite frequent offers," and preserved a reputation unique at that period.

Her idolatrous love for her only daughter was the cause of her great literary activity, for, of her many hundreds of letters, now accessible in the luxuriously edited series of "Les Grands Écrivains de la France,"[2]

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[2] 15 vol., 8°, Paris, 1862–1868.

most were written to that rather unresponsive woman. Though her interests and topics for correspondence were all-embracing, it is noteworthy that the subject of health became more conspicuous after she passed middle life. Her "triumphant health" then failed. She became rheumatic, with torticollis, and arthritis of the hands and knees, nephritic and bilious colic and other *maux.* I can find no evidence of focal infection, but more complete reading of the letters may disclose something. Her description of Vichy and its baths illustrates the best of her *reportage* qualities, as a short but charming article by Dr. Guy Hinsdale shows.[3] Scorn of disease and of physicians changed to an intense interest in the symptoms of herself and her friends, and in medical practice. She discusses chocolate, tea, coffee and rice from the standpoint of disease; she describes the uses of periwinkle tea, viper broth and crayfish eyes; she tells how the Capuchins treated her leg with herbs which they then buried. Her cousin, the witty but ribald Bussy de Rabutin, writes her of the virtues of urine. "It is said to be good for all fevers. You take the urine of the patient, and in it cook an egg; give it to a dog and the dog dies and the patient lives."

Her writings are not easy for the reader untrained in seventeenth century French. Though fluent and clear in general, they are full of archaisms, show traces of the *Precieuses* to whom she belonged in her early days, and a fondness for unusual words and phrases, not all of which are set forth in the available *Dictionnaires* but are greatly helped out by the grammatical introduction and glossary included in the edition named above.

I shall quote chiefly with a view to the medical interest, thus leaving out many evidences of wide learning, of a strong leaning toward theology and the intimate personal knowledge of the highest and most illustrious society of the reign of the Grand Monarch.

I begin with a letter of August 24, 1679:

> The Cardinal de Retz (a relative) died today after seven days of continuous fever. It was not God's will that he should have the English Remedy, although he wished it and the experience of our good Abbé of Coulanges was quite recent. His Eminence himself decided for us, extricating us from the cruel Faculty, protesting that if he had a single paroxysm he would send for the English physician. He fell sick, he requested the remedy, he had fever and was prostrated by humors that made him weak, and a hiccup that indicated bile in the stomach. All that is precisely what is proper for the treatment, and checked by the warm and vinous remedy of the Englishman. Madame de la Fayette, my daughter and I plead for mercy and presently our Abbé recovered. But God does not will that anyone should decide, and all say: "I do not wish the responsibility." At last M. Petit, supported by M. Belay, let blood four times in three days and later gave two small glasses of cassia, which distressed him, for cassia is not an indifferent remedy in malignant fevers. When the poor Cardinal was in the death agony they consented that the Englishman should be brought. He came and said he could not raise the dead. Thus perished before our eyes that man so amiable and so illustrious, whom one could not know without loving.

Soon after the Abbé needed help again and on September 29th, Madame de Sévigné writes her daughter:

> The Englishman has come to see the good Abbé, for the cold that frightens us; he has mixed with his wine and cinchona a certain sort of sweet thing which is so effective that the good Abbé feels his indisposition quite recovered.

Cousin Emmanuel de Coulange, who had a pretty taste for sonnets and madrigals, celebrated the recovery by a couplet saying:

De la liqueur charmante
Qu'un médecin anglais répand sur son cerveau.

In the same letter Madame de Sévigné speaks of Hautefeuille, who was instantly cured of flux of the chest and of a continued fever, and says that "Tabord" has gone to Spain to treat the queen. Several other brief references to the healing of the Abbé follow in other letters. On October 6th, she wrote her daughter: "The good Abbé is perfectly well . . . The Englishman is divine," but the very next day she says of the Abbé: "His hour had not yet come, as the others' had."

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[3] *N. York M. J.*, 1917, cvi, 1121.

On All Saints' Day she writes that the Englishman's remedy is soon to be made public, "which will make the doctors contemptible with their bleedings and their medicines."

In the *Mercure Galant* of October, 1679, it is stated that "the King, convinced of the excellence of the remedy, bought it, and it is a secret of which M. Daquin, chief physician to His Majesty is the present possessor."

On November 24th she writes her daughter:

> Mon Dieu, my dearest, what a charming letter! . . . What a pleasure to hear you discourse on all the topics you treat! That on medicine transports me. I am sure that with the intelligence and facility for learning that God has given you, you will know more than the doctors; you lack some experience, and you cannot kill with impunity as they do; but I would trust myself more willingly to you than to them for an opinion on a disease. Health alone is considered in this world: *Comment vous portez-vous? Comment vous portez-vous?* . . . I assure you the doctors are much scorned here, except the three or four you know and who advise the English remedy. The Englishman is about to save Marshal de Bellefonds from death. I do not believe the first physician of the King has the true secret.. . . It is then true that you are well? No lungs, no pain in the legs, no colic? See that you rest.

On January 17, 1680, she wrote her daughter:

> M. de St. Omer was *in extremis;* received all the sacraments. He had obstinately maintained he would not be bled, with a heavy fever, an inflammation. The English physician had him bled by force, imagine how he needed it; and then he restored him to life with his remedy. In three days he played chuckhole.[4]

A week later she wrote: "M. de St. Omer is cured by the Englishman. The Duchess of St. Aignan is dead. It is true the medicine was given only in the agony."

Soon after this one of her greatest sorrows came in the illness and death of her neighbor and friend, the Duke de la Rochefoucauld, author of the "Maxims," soldier, man of gallantry and fashion, and lover of Madame de la Fayette, one of Madame de Sévigné's most intimate friends—"a woman of strong mind, witty and discerning, frank, kind-hearted and true." "He (the Duke) gave me intellect," she said, "and I reformed his heart."

> I fear we shall lose M. de la Rochefoucauld this time. His fever has continued; he received Our Lord today. But his conscience is clear; the disease and death of his neighbor affect him. He is not agitated. He intends to hear the case of the physician, of Brother Angelo and of the Englishman. It is not in vain that he composed maxims all his life; he approaches his last moments as if they had nothing new or strange for him. M. de Marsillac (his son) came in . . . and after many commotions, many cabals, Gourville against the Englishman, Langlade for the latter, each one followed by many of the family and the two chiefs preserving all the ill-temper they had for each other, M. de Marsillac decided in favor of the Englishman, and today at five and at eight, M. de la Rochefoucauld took his remedy. As no one enters the house, one hardly knows the truth, but I am assured that having been near death once in the night, by the strength of the remedy and the humor of the gout he had so large an evacuation, that although the fever is not lessened there is every hope. For myself I am convinced he will recover . . . that the remedy will work the complete miracle. . . . M. de la Rochefoucauld is always in the same condition; his legs are swollen; that displeases the Englishman, but he believes that his remedy will cure everything. If it does, I shall wonder at the kindness of the doctors, that do not kill, assassinate, tear and massacre him. Du Chesne (physician to the "Invalides," recently opened) does not much care, but the others are furious.

However, the Duke died, as Madame de Sévigné wrote on March 17, 1680:

[4] A reference to Molière's play, "Le Médecin Malgré Lui."

Last Saturday the remedy of the Englishman worked marvels; the head free, the fever less; the evacuations healthy. In that state he turned to death. All of a sudden the paroxysms of fever, the oppression, the dreams; in a word, the gout strangled him treacherously, and although he had considerable strength, and had not been at all depressed by the bleedings, he only wanted four or five hours for escaping; and at midnight he gave up the Ghost.

Nothing could be more characteristic than the way in which Madame de Sévigné gives the charlatan credit for all improvement, rails at physicians for their failures, and accepts the failures of the quack with never a suspicion of blame or responsibility. Her fondness for non-professional remedies is well shown in a letter to her daughter on November 22, 1680: "Pray do not lose the Capuchin water your cook took you; it is a marvel for all pains of the body, blows on the head, contusions and even cuts, when one has courage to bear the pain."

Again we hear of friends cured by the English remedy—M. d'Evreux, M. de Lesdiguière, . . . "cured by a miracle, and thousands more." Among those were many illustrious persons who fell sick on a tour in Flanders: The Prince of Condé, the Dauphin and Dauphiness, Colbert, the Duke of Villeroi, all were cured, it was said, by the English remedy.

On the other hand, M. d'Hautefort, famous for his parsimony and said to be the original of "L'Avare," refused the remedy, saying, "It was too dear," and died. He was told it cost only 40 pistoles. He said, while dying: "Too much."

It was not until November, 1680, that we read of the interest of the King:

> Chevalier Talbot (the change in the spelling is said to have been due to a desire for a more distinguished name) promised the King on his head, and so positively, to cure Monseigneur in four days, both of the fever and the diarrhea, that if he does not succeed I believe they would throw him out of the window. But if his prophecies are as true as they have been for all the sick he has treated, they should build him a temple as to Aesculapius. . . .

(The *Mercure* of October, 1680, says that Daquin used the remedy for curing intermittent fevers, and that Fagon, the physician to the Queen, also knew how to prepare it.)

The King made him prepare the remedy before him, and confided to him the health of Monseigneur. As for the Dauphiness, she is already cured, and the Count de Gramont said yesterday in Daquin's face:

> Talbot is the conqueror of death;
> Daquin cannot resist him;
> The Dauphin is convalescent
> As everyone sings.[5]

The King, convinced of the virtues of Talbor's remedy, purchased the secret, and had Talbor publish it. Talbor died in 1681, too early to profit by the *réclame* given by the sale of the remedy. The work appeared in French, and was soon translated into English. The title page of the copy in the Surgeon-General's Library is as follows: "The ENGLISH REMEDY:/ or,/ TALBOR'S WONDERFUL SECRET, FOR CUREING OF Agues and Feavers/ SOLD By the Author Sir Robert Talbor, to the/ most Christian King, and since his/ Death, ordered by his Majesty to be/ Published in *French* for the Benefit/ of his Subjects./ AND NOW/ Translated into English for Publick Good—London:/ Printed by J. Wally for Jos. Hindmarsh at the/Black Bull in *Cornhill.* MDCLXXII. 5¾ × 3 11/16, p. 112.

The bookseller's preface has a marked political tendency:

> As the French King hath learned of an Englishman the Secret of Curing Agues in the natural body, so he may learn from the prudent conduct of England's King (if it be not too hard to be imitated) the royal secret of stopping the Ague fits of the State, occasioned by the fermentations of corrupt and seditious humors in some of the noble parts, and in the lower regions of the body politick, and of curing the Distempers without much purging or blood-letting.

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[5] A parody on a chorus in "Alceste" by La Fontaine.

The remedy was an extract of Peruvian bark in claret, the formula varied from time to time to disguise it, a method still used by some makers of proprietary remedies. It may be stated that the word cinchona came from a mistaken spelling of the name of the Countess of Chinchon; the name "Cortex Sinensis" from the supposed source in China, while the word quinquina, or kina-kina is said to be the Indian name for fever and ague.

Talbor tried to corner the market by buying up all the bark in France, the price going up to £15 sterling, a pound, later falling to 4 or 5. The Jesuits had sold it at 8 or 9 shillings for a dose of two drachms. According to La Fontaine, Louis XIV bought large quantities in Lisbon and Cadiz.

Talbor gave the remedy at the end of a fit of ague, or in quartans the night before the expected paroxysm. It was repeated every three hours, except during sleep, up to the time of the next fit, and when they were broken, in the morning and evening. He recognized that the virtue of cinchona was exerted chiefly in periodic fevers.

From time to time Madame de Sévigné made further references to cinchona in her correspondence, in the illnesses of various people, including the King. Thus October 16, 1689: "What joy, my dear child, that the quinquina has made its usual miracle!" Again, December 1, 1690, "M. de Grignan has been taken very severely four or five days with colic and continued fever, with two paroxysms a day. That would be serious if it had not been arrested by the ordinary miracles of quinquina; but do not forget that it is just as good for the colic as for the fever."

I may overrate the importance of the influence of the great letter writer, but I do not feel the need of apologizing for quoting from her epistles.

REGULATING PHYSICIANS IN COLONIAL VIRGINIA

By EDWARD INGLE

RICHMOND, VA.

INTERESTING reflections of circumstances of medical practice in colonial Virginia appear in William Waller Hening's "Statutes at Large," a collection, in thirteen volumes, of the laws enacted by the General Assembly of the Colony.

In studying this collection, one of the basic sources of the history of Virginia, as well as the statutes of other American colonies, one should bear in mind that a tendency of law-making bodies of the time was to reproduce, on this side of the water, English laws or customs, that enactment was not infrequently the end of the subject-matter and that ills to be cured by law may have been anticipative rather than actual.

The first important legislation affecting physicians seems to have been in 1639, thirty-two years after the settlement at Jamestown had assured permanent English life on this Continent. It was virtually repeated in 1646. Additions to it came in 1661, 1662 and 1736, with modifications in the meanwhile. The full texts of four of the laws follow.

ACT XV—MARCH, 1645–6

Whereas by the 9th act of Assembly held the 21st of October, 1639, consideration being had and taken of the immoderate and excessive rates and prices exacted by practitioners in physick and chyrurgery and the complaints made to the then Assembly of the bad consequence thereof, It so happening through the said intollerable exactions that the hearts of divers masters were hardened rather to suffer their servants to perish for want of fitt meanes and applications than by seeking releife to fall into the hands of griping and avaricious men, It being apprehended by such masters who were more swayed by politick respects than Xian (Christian) duty or charity, That it was the more gainfull and saving way to stand the hazard of their servants than to entertain the certain charge of a physitian or chirurgeon whose demands for the most parte exceed the purchase of the patient, It was therefore enacted for the better redrese of the like abuses thereafter vntil some fitter course should be advised on, for the regulating phisitians and chirurgeons within the collony, That it should be lawfull and free for any person or persons in such cases where they should conceive the acco't of the phisitian or chirurgeon to be vnreasonable either for his pains or for his druggs or medicines, to arrest the said phisitian or chirurgeon either to the quarter court or county court where they inhabitt, where the said phisitian should declare vpon oath the true value worth and quantity of his druggs and medicines administred for the vse of the plt. wherevpon the court where the matter was tryed was to adjudge and allow to the said phisitian or chirurgeon such satisfaction and reward as they in their discretion should think fitt, And it was further ordered that when it should be sufficiently proved in any of the said courts that a phisitian or chirurgeon had neglected his patient, or that he had refused, being thereunto required, his helpe and assistance to any person or persons in sickness or extremity, That the said phisitian or chirurgeon should be censured by the said court for such his neglect or refuseall, which said act and every clause therein mentioned and repeated, *this present Assembly to all intents and purposes doth revive, rattifie, allow, and confirme with this only exception* that the plts. or patients shall have their remedie at the county courts respectively vnless in case of appeale.—Hening's *Statutes*, i, 316.

ACT XXIV—MARCH, 1660–1

Chirurgeons accounts pleadable

Whereas by a former act of assembly no accompts are pleadable against dead men's estates whereby some scruples have been made about the accompts of phisitians and Chirurgeons cannot possibly take bills, *Bee itt therefore enacted* that phisitians and chyrurgeons accompts shall be pleadable and recoverable for meanes administred and paines taken in the fitt of sicknesse whereof the patient dyes, and where the patient recovers six months after such recovery and noe longer.—Hening's *Statutes*, ii, 26.

ACT XCII—MARCH, 1661–2

Chirurgions accounts regulated

Whereas the excessive and immoderate prices exacted by diverse avaritious and gripeing practitioners in phisick and chirurgery hath caused several hardhearted masters swayed by profitable rather than charitable respects, rather to expose a sick servant to a hazard of recovery than put themselves to the certaine charge of a rigorous though unskilfull phisician, whose demands for the most part exceed the purchase of the patient, many other poore people also being forced to give themselves over to a lingering disease, rather than ruine themselves by endeavouring to procure an uncertaine remedy, for the redrese thereof for the future, *Be it enacted* that it shall be lawfull for any person or persons conceiving the accompt of the phisician or chirurgeon unreasonable to arrest the said phisitian or chirurgeon to the generall or county court where the said phisitian or chiryrgion shall declare upon his oath the true value, cost and quantity of the drugs administred, for which the court shall grant order against the plaintiff with fifty per cent advance, and such consideration for his care, visitts and attendance as they shall judge he hath deserved, and if it shall appeare by evidence that the said phisitian or chirurgeon hath neglected his patient while he was under cure, the court shall censure him to pay so much as they in their discretion shall think reasonable.—Hening's *Statutes*, ii, 109.

Act III, April, 1692 (Hening's *Statutes* iii, 103), amended the Act of 1661–2, characterizing the "arrest" to court as "being in itselfe unreasonable," and permitting the court to increase the allowance for medicine, etc. In a later general law, relating to administration of estates (Hening's *Statutes*, iii, 379), courts were permitted to "put such a reasonable valuation upon the medicines administred, and the visits, attendance and other services performed, as to them shall seem meet and just."

ACT, CHAPTER X, AUGUST, 1736

An Act for regulating the Fees and Accounts of the Practicers in Phisic.

I, Whereas the practice of phisic in this colony, is most commonly taken up and followed, by surgeons, apothecaries, or such as have only served apprenticeships to those trades, who often prove very unskilful in the art of a phisician; and yet to demand excessive, and exact unreasonable prices for the medicines which they administer, and do too often, for the sake of making up long and excessive bills, load their patients with greater quantities thereof, than are necessary or useful, concealing all their compositions, as well to prevent the discovery of their practice, as of the true value of what they administer: which is become a grievance, dangerous and intolerable, as well to the poorer sort of people, as others, and doth require the most effectual remedy that the nature of the thing will admit:

II, *Be it therefore enacted, by the Lieutenant-Governor, Council, and Burgesses, of the present General Assembly, and it is hereby enacted, by the authority of the same,* That from and after the passing of this act no practicer of phisic, in any action or suit whatsoever, hereafter to be commenced in any court of record in this colony, shall recover, for visiting any sick person, more than the rates hereafter mentioned: that is to say,

Surgeons and apothecaries, who have served an apprenticeship to those trades, shall be allowed,

	l.	s.	d.
For every visit, and prescription, in town, or within five miles,	00	5	00
For every mile, above five, and under ten,	00	1	00
For a visit of ten miles,	00	10	00
And, for every mile, above ten,	00	00	06
With an allowance for all ferriages on their journeys.			

	l.	s.	d.
To Surgeons, For a Simple fracture, and the cure thereof,	02	00	00
For a compound fracture, and the cure thereof,	04	00	00

But those persons who have studied phisic in any university, and taken any degree therein, shall be allowed,

	l.	s.	d.
For every visit, and prescription, in any			

town, or within five miles,	00 10 00
If above five miles, for every mile more, under ten,	00 1 00
For a visit, if not above ten miles,	1 00 00
And, for every mile, above ten,	00 1 00

With an allowance of ferriages, as before.

III, And to the end the true value of the medicines administered by any practicer in phisic, may be better known, and judged of, *Be it further enacted, by the authority aforesaid,* That whenever any pills, bolus, portion, draught, electuary, decoction, or any medicines, in any form whatsoever, shall be administered to any sick person, the person administering the same shall, at the same time, deliver his bill, expressing every particular thing made up therein; or if the medicine administered, be a simple, or compound, directed in the *dispensatories,* the true name thereof shall be expressed in the same bill, together with the quantities and prices, in both cases. And in failure thereof, such practicer, or any apothecary, making up the prescription of another, shall be nonsuited, in any action or suit hereafter commenced, which shall be grounded upon such bill or bills: nor shall any book, or account of any practicer in phisic, or any apothecary, be permitted to be given in evidence, before a court; unless the articles therein contained, be charged according to the directions of this act.

IV, *And be it further enacted, by the authority aforesaid,* That this act shall continue and be in force, for and during two years, next after the passing thereof, and from thence to the end of the next session of assembly.—Hening's *Statutes,* iv, 509.

SOME ENGLISH WORTHIES OF SCIENCE OF INTEREST TO OPHTHALMOLOGISTS*

By BURTON CHANCE, M. D.

PHILADELPHIA, PA.

WHEN the invitation to address you was received, I was immersed in the recent publications on the study of color vision, in the preparation of the annual contribution of that chapter to *Ophthalmic Literature*. The honor of being asked to visit you was too great for me to refuse, and yet, what subject to choose to present to you was a problem I could not then readily solve.

In one's studies in the still unsolved enigma of color vision, certain men's names occur and recur, again and again, so that from iteration one inevitably links a name with a subject until the name becomes almost an abstraction. And yet, as one goes on, from time to time, one is compelled to ask, "Of what manner of man was he who discovered the 'Properties of Light', or he, who helped to define those properties?" Or, again, "that one who failed by reason of his own defect, to see certain of those properties?" And, "Who was he, who, for all time, set the basis upon which has been built all effort for the understanding of how and by what means these properties are perceived by our senses?"

Because I have had to satisfy my own longings, I come before you with the thought that perhaps you too have asked these questions and are willing to contemplate for a few moments certain aspects of the lives and works of some of the English worthies of science who are of interest to ophthalmologists.

It will be interesting, as we go along, to note that although that discovery has been of inestimable value, for which we ophthalmologists honor each of whom we shall speak, yet, it may be that that great thing was only one of the many discoveries which he made, while in his other subjects he stands supreme and the principles which he formulated have stood the test of time. Let us then, for a little while, dwell with Sir Isaac Newton, William Wollaston, John Dalton and Dr. Thomas Young, each one of whom possessed character and personality which made him an outstanding individual in his generation. I will not do more than refer to their discoveries or observations in the optical sciences, for those are already well known to you, but shall tell rather of their usefulness in other fields of science.

SIR ISAAC NEWTON

On Christmas day, of the eventful year 1642, the first year of the "Great Rebellion," while all England was in the throes of civil war, there was born, at the lonely manor farm of Woolsthorpe, a hamlet in the parish of Colsterworth near Grantham, in Lincolnshire, a tiny and feeble baby, Isaac Newton, destined to wrest from Nature her secrets and to claim for man greater benefits through Peace than were ever adjudged by the fortunes of War, and to win for himself the title of England's greatest natural philosopher.

His family had possessed the small estate for more than a hundred years; and his father had died there a few months after his marriage to Harriet Ayscough, and before the premature birth of his son. The widow married again three years later, and moved away leaving her weakly child, who had not been expected to live through his earliest infancy, under the charge of her mother. Sir Isaac used to relate he had often heard his mother say, when he was born he was so little that they might have put him into a quart mug. Yet that frail tenement which seemed scarcely able to imprison its immortal mind was destined to enjoy a vigorous maturity, and survive even the average term of human existence.

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*An address delivered before the Section on Ophthalmology of the Medical Society of the District of Columbia in Washington, Friday, February 4, 1921.

Newton's education was commenced at the parish school, and when he was about twelve years old, he was sent to Grantham Grammar School for classical instruction. After the free, cheerful life of the farm at Woolsthorpe he found school tiresome and dull; lessons bored him, and he sank steadily to the bottom of his class. Here he might have remained, lonely and disgraced, had not a spiteful schoolfellow given him a severe kick in the stomach. The challenge seemed to waken Newton's spirit. He turned upon his enemy, and fought till he had gotten the victory. This physical contest, in which he had hardly hoped to come off triumphant, roused his ambitions in other directions. He determined that if his body were weak he would rule by his mind. The books that he had tossed into a corner were now picked up and studied. He was fond of drawing and sometimes wrote verses. Increased knowledge soon made him love learning, and before he left the school he had won the coveted post of head boy.

The peculiar bent of his mind soon showed itself in his recreations. While other boys were playing games, Newton would busy himself with mechanical contrivances; among these was a model of a windmill, turned either by the wind, or by a mouse, which he called the miller, enclosed in it; a carriage, moved by the persons who sat in it; and a water clock, which was long used in the family of Mr. Clarke, an apothecary, with whom he boarded at Grantham. This was not his only method of measuring time; the house at Woolsthorpe, whither he returned at the age of fifteen, long contained sundials made by him during his residence there. Sometimes a little group of schoolfellows would gather around him looking with interest at his clever little contrivances, but, as a rule, they found him dull and silent, and they thought him stupid in his dislike of games. So he became a somewhat lonely schoolboy, and, when his mother, who had returned home again a widow, with three children, suggested that as he was nearly fifteen he should come home to help with the duties of the farm, he made no objection.

For a time he went to and from market at Grantham, carrying eggs and cheese, under the guidance of a farm servant. But the eggs and cheese were left to look after themselves on the market stall, while Newton passed his time in reading, sometimes by the wayside, sometimes at the house of Mr. Clarke, the apothecary. His mother no longer opposed the evident tendency of his disposition and agreed that it was quite useless trying to make him a farmer. He returned to school at Grantham, and, when an uncle, his mother's brother, who had been at Cambridge, suggested that the boy should be sent to college, she made up her mind to try this plan of ending the difficulties. The news enraptured him, and with a heart full of joyous hope, he entered Trinity College, Cambridge, in 1660, in his eighteenth year. Cambridge was consequently the real birthplace of Newton's genius. Here he at once found himself in the midst of friends. He delighted in the air of learning which filled the University, and he set himself to his studies with such enthusiasm that very soon he had made himself known as a scholar among the rest of the undergraduates. To him, the hard facts of mathematics were more entrancing than any other study, and he eagerly devoured every book on the subject upon which he could lay his hands. Euclid came his way, but he found it so easy that he laid it by as "a trifling book," and threw himself into Descartes' "Geometry." Before long, he began to make observations for himself, and he set himself to calculate and explain natural phenomena, such as the yellow halos often to be seen round the moon. In 1665 he took his degree of Bachelor of Arts, and in 1666, in consequence of the breaking out of the

Plague, he was obliged for a time to quit Cambridge. In 1668 he was made Master of Arts, and later a Senior Fellow, when he was not more than twenty-three years old.

This change of residence interrupted the optical researches which he had undertaken in which he had already laid the foundations of his great discoveries later. In 1664 he acquired a prism with which, in 1666, he decomposed light into the colored rays of which it is compounded, and, having ascertained the principal cause of the confusion of the images formed by refraction, he had turned his attention to the construction of telescopes which should act by reflection and be free from this evil. He had not, however, overcome the practical difficulties of his undertaking, when his retreat from Cambridge for a time stopped his train of experiments and inventions.

On quitting Cambridge, Newton returned to Woolsthorpe, where his mind was principally employed upon the system of the world. The theory of Copernicus and the discoveries of Galileo and Kepler had at length furnished the materials from which the true system was to be deduced. The existence of a central force had been surmised, and the law of action guessed at; but no proof had been given of either and little attention had been awakened by the conjecture. Yet Newton's discovery was quite independent of any speculations of his predecessors. The circumstances attending it are comprised in the well-known story of the falling apple.

Three years later he was back at Cambridge with all the distinction of a "Fellow." From this date his fame grew rapidly, and he attracted such attention that soon the other members of the University talked about him as "an unparalleled genius."

In 1668 he completed his first reflecting telescope, with which he observed Jupiter's satellites. In a variety of ingenious and interesting experiments where a spectrum was produced by sunlight refracted through a prism, in a darkened room, he was led to the conclusion that rays of light which differ in color differ also in refrangibility. This discovery enabled him to explain an imperfection of the telescope, which had not till then been accounted for. The indistinctness of the image formed by the object-glass was not necessarily due to any imperfection of its form, but to the fact of the different colored rays of light being brought to a focus at different distances. He concluded rightly that it was impossible for an object-glass consisting of a single lens to produce a distinct image. He went further, and too hastily concluding from a single experiment, that the dispersive power of different substances was proportional to their refractive power, he pronounced it impossible to produce a perfect image by a combination of lenses. This conclusion, since proved erroneous by the invention of the achromatic telescope, turned Newton's attention to the construction of reflecting telescopes; and the form devised by him is the one which, at later periods, proved so useful in astronomical researches.

In 1669 a professorship fell vacant and he was offered the post. He accepted it gladly, and began a series of marvelous lectures on "Optics." After this, outside recognition was not slow in coming, and he entered upon a brilliant career of discovery. On January 11, 1672, Newton was elected a Fellow of the Royal Society, a gathering founded at the time of the Restoration.

Membership in the Royal Society gave Newton opportunities for explaining his theories to men of understanding. He was pleased at his election and he wrote to the Secretary that "he would endeavor to show his gratitude by communicating what his poor and solitary endeavors can effect towards the promoting of philosophical design." The promise was soon fulfilled, for, early in the February following his election, the Secretary received a letter from Newton containing his "New Theory about Light and Colors," which gave an account of the experiments with the prism in 1666. The experiments showed conclusively that "Light consists of Rays differently refrangible"; that "Colors are not Qualifications of Light derived from Refractions of Natural Bodies, but original and connate properties, which in divers Rays are divers . . . The least refrangible rays are all disposed to exhibit a red color; the most refrangible rays are all disposed to exhibit a deep violet color"; while "White light is ever compounded, and to its composition are requisite all the aforesaid primary colors mixed in proper proportion." It was ordered that "the author be solemnly thanked for this very ingenious discourse, and be made acquainted that the society thinks very much of it."

Newton did not attend the meetings of the Royal Society until many years after his election. His contributions were solely by letters to the Secretary, Henry Oldenburg. His election to full Fellowship took place in February, 1675. He had expressed a wish to resign only a few days before his election because he was pecuniarly unable to pay the weekly dues of one shilling; and the distance to London from Cambridge, where he resided, was too costly for him to undertake. Moreover, he had expected that he would have to vacate his fellowship owing to his not being in holy orders. The difficulty was solved by a patent from the King permitting him as Lucasian professor to hold a fellowship although he was a layman.

As Newton's fame increased, he became more and more involved in outside discussions. "I see," he said, "that I have made myself a slave to philosophy." But his natural courtesy made him weary himself out in explaining point after point to his critics, even at a time when he was greatly harassed by the lack of money for everyday affairs. Happily this last difficulty was set right by the University, which might well cherish a spirit of such clear genius. From 1666 till 1686 he was busy with problems about the laws of gravity. He unfolded his ideas to Sir Christopher Wren, Halley, and Hooke, who often discussed with care and enthusiasm points which were far beyond the grasp of the ordinary citizen. The Great Plague and the Great Fire ravaged the City of London; Parliament was torn with struggles over the Bill to exclude the Duke of York as a Catholic from the succession to the throne. Statesmen rose and fell. Charles II died, and James II succeeded, and all this time Newton was busy getting ready his great treatise.

In those years of study and deep thought, Newton passed through the exaltation and the despair of genius seeking to give expression to some great truth. In all this he was helped by Halley, foremost among his admirers, the most generous and unselfish of disciples, the best and most affectionate of friends, who never lost heart, whose faith never wavered. On that April day in 1686, when the manuscript treatise, "Philosophiæ Naturalis Principia Mathematica," was laid open to the Royal Society, Halley's excitement almost equalled that of Newton; and well Halley might be, for it was he who tracked Newton to his College, who drew from him his great discoveries, and who generously gave him to the world. Congratulations soon poured in from the members eager to outdo one another in expressing their wonder at the lecture.

But there was one gloomy face among them in the person of Dr. Robert Hooke, who was almost seven years older than Newton, and was one of the original, unelected members of the Royal Society. He declared he had himself made the discovery, and had communicated it to Newton in correspondence with him in 1679; he, therefore, had at least expected to find his work mentioned in the treatise. Halley as usual rushed into the breach with the suggestion that Newton should write a preface, containing a reference to Hooke. At the same time he made it clear that he did not himself consider Hooke had any real claim. As for the Royal Society, he says in a letter to Newton:

> I found they were all of opinion that nothing thereof appearing in print, nor on the books of the Society, you ought to be considered as the inventor. And if in truth, he (Hooke), knew it

before you, he ought not to blame any but himself for having taken no more care to secure a discovery which he puts so much value on.

Newton, however, was much distressed by the incident. No man was freer from an intention to snatch an idea from a colleague, and his intensely chivalrous nature shrank from the very thought of such a deed. After all these years of study, was he to find the gilt of his discovery rubbed off by the jealous complaints of a disappointed rival? He settled the matter, however, by adding to his work the following sentence: "The inverse law of gravity holds in all the celestial motions, as was discovered also independently by my countrymen, Wren, Hooke, and Halley." This satisfied everyone, and in 1687, the "Principia" was published. Halley paid all the expenses, he corrected the proofs; he laid aside his own work in order to press forward to the utmost the printing, lest anything should arise to prevent the publication.

During the latter part of 1692, and the beginning of 1693, Newton's health was considerably impaired, and he labored in the summer under some epidemic disorder. It is likely that the precise character or amount of his indisposition will never be discovered; but it seems, though the opinion has been much controverted, that for a short time it affected his understanding, and that in September, 1693, he was not in the full possession of his mental faculties. The disease was soon removed, and there is no occasion to suppose that it ever recurred. But the course of his life changed; and from this time forward he devoted himself chiefly to the completion of his former works and abstained from any new career of continued research.

After the publication of the "Principia," Newton took an active part in public affairs. On two separate occasions he represented his University in Parliament. He had no desire to figure in the hot contests of the Commons, and he seldom spoke, though he conscientiously carried out the duties of his position. Here he met Charles Montague, afterwards Earl of Halifax, who gave him the well-paid office of Warden of the Mint, in 1696. This left him enough leisure to carry on his studies with an easy mind, though he was not the man to accept a post without accepting all its responsibilities. While he was at the Mint, "he would be about the King's business" and he toiled long on its behalf, carrying out with extreme care and ability the important operations connected with a recoinage. Even so late as 1718 he presented reports to Parliament on the state of the coinage.

Still he found time to superintend the editions of his earlier works, which successively appeared with very material additions and improvements. The great work on "Optics" appeared for the first time in a complete form in 1704. His first lectures, read at the University of Cambridge in the years 1669, 1670 and 1671, were verbal only; and were read at the Royal Society in 1675. In this treatise are detailed such subjects as "Reflections, Refractions, Inflections and Colors of Light," and he lays down the "Laws of Refractions and Composition of Colors." In 1717 he issued a second edition. The copy which I have is a fourth edition printed in 1730, from a third edition prepared by Sir Isaac's "own Hand and left before his Death with the Bookseller." Newton was a student of alchemy, and he left a remarkable monument of his interest in theology, especially prophecy, in a work on the Prophecies of Daniel, and on the Apocalypse; a history of the Creation and a number of tracts.

Years passed by, bringing many honors to the boy who had once been meant to follow the quiet career of a farmer. In 1703 he was chosen President of the Royal Society, and he was annually reelected to this office during the remaining twenty-five years of his life. In 1705 he was knighted by Queen Anne, upon her visit to Cambridge. Newton accepted these signs of respect with the frankness of a child. His natural sweetness of temper made him grateful for every favor, but he was never deluded into mistaking the tawdry for the real. Nothing shook his devotion to science, and to the last he found his greatest pleasure in working out problems. All the world heaped compliments upon him. He recognized the kindness which prompted them, but his simplicity remained untarnished. "I know not what I may appear to the world," he said not long before he died, "but to myself I seem to have been only like a boy playing on the seashore, diverting myself now and then finding a smooth pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me." He declared that whatever service he had done to the public was not owing to any extraordinary sagacity, but solely to industry and patient thought.

Newton's life in London was one of much dignity and comfort. He was courted by the distinguished of all ranks, and particularly by the Princess of Wales. Newton's liberality to others was almost boundless, yet he died rich. His domestic establishment was liberal, presided over by his step-niece, Mrs. Barber, a woman of much beauty and talent. He died without a will; his property descended to the grandchildren of his mother and to Mrs. Barber, who married Sir Isaac's assistant and successor at the Mint. Newton has been described as in person not above the middle size; of a courtly and gracious aspect with a fine head of silvery hair. He never wore spectacles, and had lost only one tooth even at the day of his death. In manners his appearance was usually untidy and slovenly. Many stories have been told of his extreme absence of mind when occupied with his work.

With the exception of the attack in 1693, Newton's health had usually been very good. He suffered much from stone during the last years of his life. He was laid up with inflammation of the lungs and gout in 1725, but was better after this for some time. His mental faculties remained in general unaffected, but his memory was much impaired. In 1726 appeared the third edition of the "Principia." From the year 1725 he lived at Kensington, but was still fond of going to London occasionally, and visited it on February 28, 1727, to preside at a meeting of the Royal Society. The fatigue appears to have been too great, for the disease attacked him violently on March 4th, and he lingered in great suffering till the 20th, when he died, aged eighty-five years. One of the finest geniuses England has ever produced and one of the most simple-hearted. He was buried with great pomp in Westminster Abbey, where there is a monument to his memory.

Many admirers of Sir Isaac Newton have asserted that his was the most gigantic intellect ever bestowed on man. It is true he discovered the law of gravitation, and by it explained all the broader phenomena of nature, such as the movements of the planets, the shape and revolution of the earth, the succession of the tides, yet he only demonstrated mathematically Copernicus' assertion that the planets moved. Newton should not be regarded as an isolated phenomenon, a genius but for whom the world would have been in darkness. In all his labors he was but following the spirit of the times. The love of Science was abroad, by other men who had been working along similar lines. And, today, many of the problems which engaged them are as much unsolved as they were by Sir Isaac and his associates. An estimate of his genius is impossible. The inscription of his monument in Westminster Abbey ends: "Let Mortals rejoice that there has existed such and so great An Ornament of Human Nature."

WILLIAM HYDE WOLLASTON

Among the many eminent persons educated at the famous Charterhouse, not the least distinguished was William Hyde Wollaston, one of the ablest and most renowned of English chemists and natural philosophers. He was born at East Dereham, in Norfolk, on August 6, 1766. He was the second son of the seventeen children of the Rev. Francis Wollaston, rector of Chiselhurst, and an ardent astronomer.

Wollaston was educated first at a private school, and then at Charterhouse, and completed his education at Caius College, Cambridge, which he entered when only sixteen years of age. He did not graduate in Arts, but, with a view of practicing medicine, proceeded to the degree of M.B., in 1787, gaining a fellowship in the same year, which he retained for the rest of his life, being the Senior Fellow at Caius at his death. He held the offices of Greek and Hebrew lecturer. In 1793 he received the degree of M.D., and in 1795 he became a Fellow of the Royal College of Physicians.

He first established himself as a physician at Bury St. Edmunds, in Suffolk, but meeting with little encouragement, removed to London, where, making but little way, and in 1800, failing to obtain a vacant physicianship at St. George's Hospital, he abandoned the profession, vowing "never more to write a prescription, were it for his own father," and determined to devote himself wholly to scientific research. For several years he had been interested in various branches of natural sciences, and, as that interest had been increasing, his abandonment of medicine proved ultimately most beneficial, leading him rapidly to fame and fortune; for unlike many eminent investigators of nature's laws and phenomena, he combined the "genius of the philosopher with the skill of an artist," and succeeded in making industrial applications of several of his important discoveries.

His researches were pre-eminently fruitful in the science of chemistry, but they diverged on all sides into physiology, pathology, optics, acoustics, mineralogy, crystallography, astronomy, electricity, physics, mechanics, and botany, and even into art. In all he published fifty-six papers, almost everyone of which marked a distinct advance in the particular science concerned, and their publication placed him among the foremost scientific men of Europe. The majority were read before the Royal Society and appear in the *Philosophical Transactions*. He devoted much attention to the affairs of the Royal Society of which he was elected a fellow in 1793, and was made secretary in 1806. In 1823 he was elected an associate of the French Academy of Science.

The influence of Wollaston's medical training is seen in his first paper, read in 1797. It is on "Calculi," and in it he showed that in addition to calculi consisting of uric acid, calculi of the bladder might consist of calcium phosphate, magnesium ammonium phosphate, and calcium oxalate, or, a mixture of these, forming the "fusible" calculus. In his later analyses he found, in 1810, "cystic oxide," now called cystin. He thus practically exhausted the subject and rendered rational treatment possible. He also investigated the composition of prostatic and of gouty calculi. In the Croonian lecture of 1809 he showed in a strikingly simple and ingenious way, by means of the muscular murmur, that each muscular effort, while apparently simple, really consists of contractions repeated at intervals of one-twentieth or one-thirtieth of a second. In May, 1824, he gave an ingenious explanation of the apparent direction of the eyes in a portrait.

In mineralogy he made a specialty of the platinum metals, and it was he who discovered in platinum the two new metals, palladium and rhodium. Within five years he had discovered a process for making platinum malleable, which brought him a fortune of almost £30,000. The process was kept secret, until disclosed in a paper published after his death.

When Dalton's atomic theory was first clearly enunciated, in 1807, Wollaston accepted it at once and tried to convert Sir Humphrey Davy, the chief of English scientists, but in vain. In a paper on "Super-acid or Sub-acid Salts," Wollaston afforded a most powerful support to Dalton's atomic weights by the promulgation of the doctrine of "equivalents," which were intended to express the bare facts of quantitative analysis.

In optics, he described, in 1802, the total reflection method for the measurement of refractivity. It was in this paper that he drew attention to the dark lines in the solar spectrum. Of these lines, of which there are seven, since known as "Fraunhofer's lines," he regarded the most prominent as the natural boundaries or dividing lines of the pure simple colors of the prismatic spectrum, which he supposed to have four primary divisions, thus separating one from another. It was Wollaston who discovered the invisible rays beyond the violet.

Wollaston contributed various papers concerning theoretical and physiological optics. He adopted the wave theory of light, which at the beginning of the century was revived and applied to the explanation of the "interference phenomena," promulgated by his friend, Thomas Young. Among his papers may be mentioned those dealing with "Sounds Inaudible to Ordinary Ears"; and, "The Comparison of the Light of the Sun with That of the Moon and the Fixed Stars."

As an inventor of optical instruments, Wollaston ranks very high. Of these, the most important is his reflecting goniometer, with which to measure the angle contained between the two faces of a crystal, thus giving to crystallography a means for certainty and precision. In 1803, he invented "periscopic," concavoconvex spectacles, which he found useful when oblique vision is necessary. And, in 1807, he patented the camera lucida which proved of the greatest value in surveying, in copying drawings, and in drawing objects under the microscope. It was through his desire to fix the image of the camera lucida, that, later on, led Talbot to his discoveries in photography. In 1812 Wollaston described a periscopic camera obscura and microscope, providing for specially distinct vision with a wide aperture. In a posthumous paper, published in 1829, was described a microscopic doublet still used in its original form as the objective of the compound microscope.

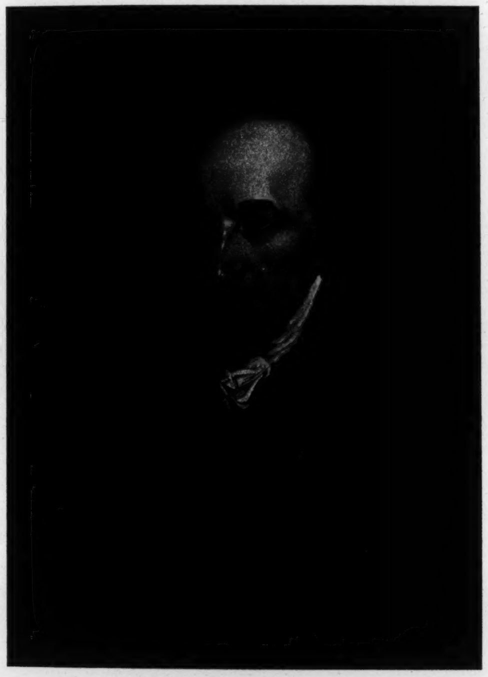
In 1814 Wollaston and Smithson Tennant, while investigating the subject of gas explosions, discovered that explosions will not pass through a small tube; a fact which was utilized independently by Davy in his safety lamp, in 1815.

He did much to establish the important physical principle that "galvanic" and "frictional" electricity are of the same nature; and he demonstrated that the action of the voltaic cell was due to the oxidation of the zinc.

In 1814 Wollaston suggested, in evidence before a committee of the House of Commons, the replacement of the various gallons, then in use, by a gallon containing ten pounds of water at a given temperature. This measure known as the "Imperial Gallon," was adopted in the Weights and Measures Act of 1824. In his connection with the efforts of various nations put forth at different times, to establish a uniform international standard, in view of the simplicity of the decimal system of weights and measures, it is of interest to learn that he was a member of the royal commission on Weights and Measures which rejected the adoption of that system, in 1819.

The majority of Wollaston's papers are short and apt in expression. "The most singular characteristic of Wollaston's mind," says Babbage, "was the plain and distinct line which separated what he knew from what he did not know: his predominant principle was to avoid error." This characteristic caution and sureness approaching infallibility struck Wollaston's contemporaries most forcibly, and they called him familiarly "the Pope," but the multiplicity of his discoveries and inventions shows that his caution was the self-imposed limit to a fertile and active imagination.

Beyond appearing at the meetings of learned societies, he took little part in public affairs. He lived alone, conducting his investigations in a deliberate and exhaustive manner, but in the most rigid seclusion, no person being admitted to his laboratory on any pretext. "Do you see that furnace?" he once said to one who had penetrated unbidden to this sacred ground. "Yes." "Then make a profound bow to it, for this is the first, and will be the last time of your seeing it." On another occasion, a distinguished foreign philosopher expressed to him an anxious desire to see his laboratory. "Certainly," he replied; and immediately produced a small tray containing some glass tubes, a blow pipe, two or three watch glasses, a strip of platinum, and a few test bottles: this, of course, could not have been the whole of his apparatus. This anecdote may be taken as an illustration of his dislike to admit anyone to his workroom. The chief events in Wollaston's life were his discoveries which flowed in uninterrupted succession from 1800 down to the time of his death. His chief interest in traveling about England and when abroad was in seeing manufactures; and the machinery of Manchester left a most vivid impression upon his thoughts.



William Hyde Wollaston
(1766–1828)

Dr. Wollaston was endowed with bodily senses of extraordinary acuteness and accuracy, and with great vigor of undertsanding.

His intimate friend, the Rev. Henry Hasted, fellow of Christ Church, Cambridge; party to a friendship begun while at Bury St. Edmunds, which lasted to the end of his life, wrote that "Wollaston had extraordinary dexterity, the 'genius of the finger-tips,' and eyesight so keen that he could distinguish minute plants while on horseback."

In character he was especially self-contained: his chief object in life was to satisfy the questionings of his own intelligence. He was more than usually resentful of curiosity about his affairs; especially at the inquisition of the commissioners of income in 1800, when his usual calm was changed "into a fever of extreme indignation." He was a warm and genial friend. He refused in 1823 a request of his brother to procure for him a place in the customs, on the ground that he would lose his independence by soliciting a favor, but he inclosed a stock receipt for £10,000 in consols with his refusal. Towards the end of his life he took to fly fishing, with Davy and to shooting and sport in general. We get a pleasant glimpse of him in the "Life of Scott" by Lockhart who says, in describing an expedition from Abbotsford to see a coursing match, "Dr. Wollaston, with his noble serene dignity of countenance, might have passed for a sporting archbishop." He was never married.

Since 1800, Wollaston had suffered occasionally from partial blindness in each eye. In February, 1824, having noticed that at times he saw only half of every object with both eyes, he put forward his important theory of the "Semidecussation of the Optic Nerves," now an accepted fact. Toward the end of 1827, he was attacked by a numbness in the left arm and in July, 1828, the left pupil became insensible. He explained his symptoms to a medical friend as if they were those of another person, and, on hearing that they probably signified tumor of the brain, with an early termination, he set about revising and dictating papers on all his still unrecorded works. Many of these were afterwards published in the *Philosophical Transactions.* Five papers by him were read during the last session of the Royal Society in that year, in one of which he alludes affectingly to his illness, as obliging him to commit his observations to writing more hastily than he was wont.

Previous to his death, he invested £1,000 of stock in the name of the Royal Society, the interest of which he directed to be employed for the encouragement of experiments in natural philosophy. He had experiments carried on under his direction in a room adjoining his sick-room, for many days previous to his death, which took place on December 22, 1828, having just before worked out a sum to show that, though speechless, he was still conscious. He was privately buried at Chiselhurst, in Kent; of which parish, his father had been rector.

John Dalton
(1766–1844)

John Dalton

In imagination let us transport ourselves to the romantic "Lake Region," to Eaglesfield, near Cockermouth, in Cumberland, to the humble cottage of the weavers, Joseph and Deborah Dalton, to whom was born a son, John, destined to dominate the philosophical world.

Three children of the marriage lived to a good old age, three of them died early. The three who lived were Jonathan, Mary and John. Jonathan was the eldest son, but where, in the family, John came, no one knows, for singularly enough, no register of his birth has been found. The Quakers do not practice any baptismal rites, although, as a rule, the births of their children are duly registered. There was, of course, no entry of the birth in the Parish Church books, and so the exact date of John's entrance into the world remained undiscovered, and was quite unknown to himself until after he became famous, when some inquiries at his birthplace elicited the fact that he probably first saw the light on the 6th of September, 1766.

John Dalton received his early education from his father and from John Fletcher, teacher of the Quakers' school at Eaglesfield, on whose retirement, in 1778, John himself started teaching. This youthful venture was not successful, the amount he received in fees being only about five shillings a week, so, after two years he took to farm work. But he had received some instruction in mathematics, and, in 1781, he left his native village to become an assistant to his cousin, George Bewley, who kept a school at Kendal. There he passed twelve years, becoming, in 1785, joint manager of the school with his brother Jonathan.

Their sister, Mary, acted as housekeeper, and their parents visited them from time to time, to bring home produce, usually accomplishing the distance of forty-four miles from Eaglesfield on foot in one day. About sixty pupils, of both sexes, attended including some boarders; and the profits reached one hundred guineas the first year. The masters were uncompromising in their discipline and somewhat over stern in punishment, although John was the milder of the two, and was, besides, too much absorbed in private study to look out for delinquencies. His progress may be judged from a syllabus of a course of lectures on natural philosophy, including mathematics, optics, pneumatics, astronomy and the use of globes, issued by him in October, 1787.

These lectures were repeated in 1791, when the price of admission was reduced from one shilling to sixpence.

About 1790 he seems to have thought of taking up medicine, but the project met with no encouragement from his relatives and he remained at Kendal until 1793, when he moved to Manchester where he spent the rest of his life.

Dalton read much in the twelve years he spent at Kendal. There was gathered the stock of knowledge which served as the basis of all his future researches. There also he acquired habits of close and meditative observation. He contributed solutions of problems and questions on various subjects to *The Gentlemen's Diary*, and *The Ladies' Diary*, and in 1787, he began to keep a meteorological diary in which during the succeeding fifty-seven years he entered more than 200,000 observations.

At Kendal, Dalton was singularly fortunate in securing the friendship of persons of similar tastes and character. In one instance, it was to a blind man that young Dalton was indebted for a close and valuable friendship. The importance which he attached to the assistance in his studies, and the aid in forming his habits of investigation which he obtained from blind Gough, Dalton acknowledged in the preface of his "Meteorological Observations and Essays," published in 1793:

> To one person particularly, I am peculiarly indebted, not only in this respect but in many others: indeed, if there be anything new and of importance to science contained in this work, it is owing, in great part to my having had the advantage of his instruction and example in philosophical investigations.

He acquired with Gough's help a little Latin, French, and Greek, and studied the chief works of English mathematicians. Mainly through Gough's friendship, he was appointed in 1793, teacher of mathematics and the physical sciences in the new college of Manchester, where he chiefly resided during the remainder of his life, though frequently employed, after 1804, in giving lectures on chemistry in several large towns. He made hygrometers of whip-cords and constructed a rude barometer and thermometer. Zoölogy and botany came in for a share of his attention, and he supplied butterflies and dried plants for the museum at Keswick.

"Meteorological Observations and Essays" contained the germs of his later discoveries, yet in spite of the originality of its matter, the book met with only a limited sale. In 1794 he was elected a member of the Manchester Literary and Philosophical Society, and a few weeks after the election on October 31, 1794, he communicated his first paper on "Extraordinary Facts Relating to the Vision of Colors," in which he gave the earliest account of the optical peculiarity known as Daltonism, or color blindness, and summed up its characteristics as observed in himself and others. Besides the blue and purple of the spectrum, he was able to recognize only one color, yellow or as he says in his paper, "That part of the image which others call red appears to me little more than a shade or defect of light. After that the orange, yellow and green seem one color which descends uniformly from an intense to a rare yellow, making what I should call different shades of yellow." He had discovered during his botanical studies his peculiarity to the hues of flowers. His defect was shared by his brother. A post-mortem examination in his own case showed his explanation, by a supposed blue tinge in one of the humors of the eye, to have no foundation in fact and was indeed erroneous. Mr. Ransome, who made the post-mortem, examined the lenses of Dalton's eyes and found them to be normal to a man of his age.

He communicated to the same society in March, 1799, "Experiments and Observations to Determine Whether the Quantity of Rain and Dew is Equal to the Quantity of Water Carried off by the Rivers and Raised by Evaporation; with an Enquiry into the Origin of Springs." The last point then much debated, was practically settled by

Dalton's conclusion that springs are fed by rain.

In the years 1808 to 1810, he published his "New System of Chemical Philosophy." Later on, he became the president of the Manchester Philosophical Society, a Fellow of the Royal Society, and a Member of the Paris Academy. Before the Manchester Society alone, he read no fewer than one hundred and sixteen papers, many of them of epochal importance. In 1833 he received a pension of £150, which was afterwards raised to £300. His fellow townsmen and friends collected £2,000 to raise a statue in his honor which was placed at the entrance of the Royal Institution in Manchester. Dalton was honored by the University of Oxford with the degree of D.C.L., and with LL.D. by Edinburgh. He was twice a Vice-President of the British Association.

In 1837 he had a shock of paralysis, which recurred in the following year and left him with broken powers. Impaired utterance hindered him from assuming the office of President of the British Association at Manchester in 1842. He had another fit in May, 1844, and made a last feeble record of the state of the barometer on July 26. On the following morning he fell from his bed in attempting to rise, and was found lifeless on the floor. He was in his seventy-eighth year. He lies buried in the cemetery in Manchester, while his memory has been kept green by statues and tablets, and various endowed scholarships.

A most amusing account of the incidents attending the presentation of Dalton at court, has been given by Babbage in his interesting book, "Scientific London":

> Firstly, he was a Quaker, and would not wear the sword, which is an indispensable appendage of ordinary court-dress. Secondly, the robe of a doctor of civil laws was known to be objectionable on account of its color,—scarlet—one forbidden to Quakers. Luckily it was recollected that Dalton was afflicted with the peculiar color-blindness which bears his name, and that, as the cherries and the leaves of a cherry-tree were to him of the same color, the scarlet gown would present to him no extraordinary appearance. So perfect, indeed, was the color-blindness, that this most modest and simple of men, after having received the doctor's gown at Oxford, actually wore it for several days in happy unconsciousness of the effect he produced on the street.

Professor Whewell reports having asked Dalton what the bright, scarlet gown which he wore resembled, and he pointed to some of the evergreen outside the window, and said, that to his eye their colors were quite alike. On the other hand, the lining of the gown, which was pink silk, he could not distinguish from sky-blue.

Dalton's chief physical researches were those on the constitution of mixed gases, on the force of steam, on the elasticity of vapors, and on the expansion of gases by heat. In chemistry, he distinguished himself by his progressive development of the Atomic theory, through which theory the science of chemistry has become revolutionized, and has yielded a greater number of valuable results than, perhaps, any other idea ever introduced into physical science.

Profound, patient, intuitive, Dalton had precisely the faculties requisite for a great scientific discoverer. In his habits, he was simple; in his manners, grave and reserved, but kindly, and distinguished by his truthfulness and integrity of character. He was described by Dr. Davy in the following unflattering terms:

> Mr. Dalton's aspect and manner were repulsive. There was no gracefulness belonging to him. His voice was harsh and brawling; his gait stiff and awkward; his style of writing and conversation, dry and almost crabbed. In person he was tall, bony, and slender. Independence and simplicity of manner and originality were his best qualities. Though in comparatively humble circumstances, he maintained the dignity of the philosophical character.

In spite of these unflattering terms, which were doubtless more critical than unkindly, those who saw most of him loved him best, and his friendship once bestowed was inalienable.

Dalton was always unexceptionally dressed in Quaker costume, knee breeches, dark grey stockings, and buckled shoes. His broad brim beaver was of the finest quality, his white neck-cloth spotless, his cane, gold or silver headed. Many of his friends were impressed by the striking likeness of his broad, expansive head to the portraits of Newton, and the likeness observed during life became more remarkable in death.

THOMAS YOUNG

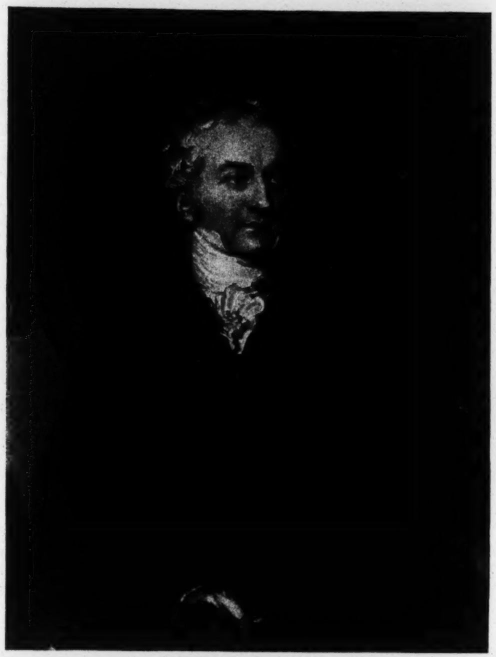
Professor Tyndall once said something to this effect: If a horizontal line were drawn from the top of Sir Isaac Newton's genius stretching to our own day, it would leave immeasurably below it every head that has since appeared excepting that of Thomas Young; and if it declined at all to reach his, the declination would be very slight!

Emerson says:

> It is a curious fact that a certain enormity of culture makes a man invisible to his contemporaries. From time to time, in history, men are born a whole age too soon. Probably the men were so great, so self-fed, that recognition of them by others was not necessary to them.

Of no man who died in the nineteenth century is this remark truer than of Thomas Young, who may be styled, without exaggeration, the most learned, profound, variously accomplished scholar and man of science that has appeared in our age—perhaps, in any age.

Thomas Young was born at Milverton, in Somersetshire, on June 13, 1773. He was the eldest of ten children. For the greater part of the first seven years of his life he lived with his maternal grandfather. According to his own account, he could read with considerable fluency at the age of two, and under the instructions of his aunt and a village schoolmistress, he "read twice through the Bible and also Watts' hymns," before he attained the age of four. When not quite seven years of age he went to a boarding school, where it appears he learned more by independent effort than under the guidance of the master. After leaving this school he lived at home for six months; but frequently visited a neighbor, a land surveyor, at whose house he amused himself with philosophical instruments and scientific books. When nearly nine he went to another school at Compton, where he remained for four years, and read several Greek and Latin authors as well as the elements of natural philosophy from books lent him by the assistant master who appears to have been a mechanical genius; and he gave Young lessons in turning, drawing, bookbinding and the grinding and preparation of colors. Before leaving the school at the age of thirteen, Young had read six chapters of the Hebrew Bible.


THOMAS YOUNG
(1773–1829)

The time is too limited for me to detail all with which this extraordinary boy was interested. He constructed a microscope; read Priestley's "Observations on Air," which introduced him to the subject of chemistry. He learned a little French which enabled him to gain an elementary knowledge of Italian. While at home he pursued the study of Hebrew, and devoted his energies to turning and telescope making. Eastern languages received a share of his attention and by the time he was fourteen he had read a Persian grammar. Before the end of the next four years, Young had gained more or less acquaintance with fourteen languages. Whatever study he commenced he never abandoned, and it was by steadily keeping to this principle, a most important one in education, that he was accustomed, in after life, to attribute a great part of his success, both as a scholar and a man of science. His motto was "What one has done another can do."

When little more than sixteen years of age Young's studies were seriously interrupted by an illness of an alarming nature which seemed to "threaten consumption." By the maternal care of Mrs. Barclay, towards whose son Young stood as tutor and companion, aided by the medical advice of Baron Dimsdale, a former physician of the Empress Catherine of Russia, and also of his uncle Dr. Brocklesby, he was restored to health, though he was for a long time subjected to a rigorous diet; "strictly confined for two years, to milk, buttermilk, eggs, vegetables, and very weak broth."

I wish that I might have the time to read to you a fragment of an autobiography in a translation from a short account written in Latin, as a record of his studies as far as the end of his fourteenth year. It is in Peacock's "Life." From it one sees how precocious the lad was.

The character of Thomas Young has made a strong appeal to me since my early undergraduate days. I have taken the keenest delight in reading anything concerning him or his works. An engraving from Lawrence's portrait hangs over my desk—the handsome face charming my day's work today with even greater force than when I first looked on it. And I have prepared this sketch of his life through my desire that others, who have not known of his life, might have some idea how truly great and yet how human Dr. Young was. I have dwelt at this length on the early years of his life only because of my endeavor to indicate how the future was foreshadowed in his youth. The last two months of 1791, he passed with his uncle, Dr. Brocklesby in London, by whom he was introduced to the most distinguished literary society of his day, among whom he was recognized as a classical scholar of no mean order.

In the autumn of 1792, Young, being then only nineteen years of age, went up to London for the purpose of studying medicine. He lived in lodgings in Westminster, and attended John Hunter's School of Anatomy. A year afterwards he entered St. Bartholomew's Hospital as a pupil and devoted himself systematically to the preparatory studies of his future profession. Giving himself with enthusiasm to the study of the eye and of vision, he embodied some striking original views in a memoir which was read before the Royal Society and published in their *Philosophical Transactions* for 1793. This paper, concerning the power of accommodation inherent in the eye was important, mainly because it was his first published paper on optical subjects. The merit of it was so great that it gained for its author the honor of membership in the illustrious Royal Society at the early age of twenty-one. He was soon after elected to be its corresponding secretary, a position which he filled with distinction for the rest of his life.

Young's paper no sooner appeared, than John Hunter claimed the discovery and announced it as his own, but Young was acquitted of the charge of plagiarism. As first stated, Young's idea suggested that accommodation was brought about by muscular action inherent within the lens. He had measured the anteroposterior diameter of his own eyes by means of a pair of compasses. He learned that when the eye was focused for different distances there was no change in the length of the axis. He settled for all time that it is the crystalline lens which changes its form during adjustment; but he was wrong in supposing the fibers of the lens to be muscular. It was not till long after the time of Dr. Young that the complicated action was fully made out, though the change of form of the anterior surface of the lens which he discovered by noticing the changes in the positions of the reflections of a candle flame on the cornea and on the lens admitted of no dispute.

The tempting offer to become the private secretary of the Duke of Richmond and the advantages which it opened were declined by Young, who had a consciousness of his own powers. One of the reasons, which he alleged, being his regard for the Society of Friends, whose principles he considered inconsistent with the appointment of private secretary to the Master General of Ordnance. He preferred the laborious, but independent, career of the man of letters; he resolved, however, to continue his medical course.

Young chose to pursue his medical studies at Edinburgh and during his residence there he mixed largely in society, not merely amongst his fellow students, but among the professors of the University and the principal inhabitants of a city and neighborhood proverbial for hospitality. He began the study of music and took lessons on the flute and thoroughly mastered the theory of the one and to some extent the practice of the other. He took private lessons in dancing and repeatedly attended performances at the theater. He gave up the costume of the Society of Friends and in many ways departed from their rules of conduct, yet throughout this change in his life he retained his high moral principles as a guide of conduct, and appears to have acted from a firm conviction of what was right.

At the close of his studies in Edinburgh, he proceeded to Goettingen where in due time he took his degree of M.D., closely applying himself the while to music, dancing, horsemanship, drawing, history, philosophy, as well as to medicine. The subject he selected for his public discussion, necessary for his degree, was "The Human Voice." According to his own account, this study of "Sound," laid the foundation of his subsequent researches in the undulatory theory of Light.

When first he tried to leap a fence on horseback he fell at ten paces. He remounted, and made a second attempt, was again unseated, but this time was not thrown farther than on the horse's neck to which he clung. At the third trial he succeeded, and he repeated his feats to an almost incredible extent even in the midst of consummate artists.

Those who are fond of drawing contrasts may on the one side represent to themselves the timid Newton never riding in a carriage, so much did the fear of being upset preoccupy him, without holding to the doors with extended arms; and on the other, his distinguished rival galloping on the backs of two horses with all the confidence of an equestrian by profession.

Almost immediately on his return to England he was admitted as a Fellow of Emmanuel College, Cambridge, in order to take his English degree of M.D. At that time there was no system of medical education in the University and the statutes required that six years should elapse between the admission of a medical student and his taking the degree of M.B. Young appears to have attracted little attention as an undergraduate in college. His course has been described by a tutor of Emmanuel:

> He rarely associated with the young men of the college, who called him with a mixture of derision and respect, "Phenomenon Young," but he lived on terms with the Fellows in the Common Room. He had few friends of his own age or pursuits in the University. He would not converse with any one but as an equal. A famous Doctor, who was in the habit of making unopposed dogmatical observations was somewhat taken aback by Young's correction of a statement he had made, quoting his references. "A smart young man that," he admitted, when Young left the Combination Room.

His uncle, Dr. Brocklesby, dying about this time, Young inherited his house with the furniture, books, pictures, prints and about £10,000.

During his residence at Cambridge he availed himself of every opportunity of entering into general society, so much so, as sometimes to interfere with the prosecution of his studies, yet, "in his manners he had something of the stiffness of the Quakers remaining, and though he never said or did a rude thing, he never made use of any of the forms of politeness, not that he avoided them through affectation; his behavior was natural without timidity, and easy without boldness."

In the summer of 1798, while in London, a slight accident resulting in the fracture of one of the metatarsal bones compelled Young to keep to his rooms, and being thus forcibly deprived of his usual round of social intercourse he returned to his favorite studies in physics. He prepared a memoir entitled "Outlines and Experiments Respecting Sound and Light." Some of the conclusions and speculations, to which these investigations lead, are of great theoretical importance, not merely as tending to correct many prevalent errors and misconceptions respecting the propagation of sound, but especially as establishing the great principle of the interference of sounds, and the explanation of the phenomena of beats and of the grave harmonies which are founded upon it. A principle which speedily conducted him to the discovery of the kindred principle of optical interferences; "which has proved," says Sir John Herschel, "the key to all the more abstruse and puzzling properties of light and which would alone have sufficed to place its author in the highest rank of scientific immortality even were the other innumerable claims to such a distinction disregarded."

In a letter to Nicholson's *Philosophical Journal* for 1801, he made the first public announcement of the extension of the principle of interference from sound to light, and the consequent establishment of its propagation by undulation. The first memoir, "On the Theory of Light and Colors," in which this discovery was developed, was read to the Royal Society, on the 12th of November. It was succeeded by a second, entitled, "An Account of Some Cases of the Production of Colors," in 1802, and by a third, in 1803, entitled "Experiments and Calculations Relative to Physical Optics." The publication of these memoirs constitutes the first great epoch in the history of his optical discoveries. After the completion of the first of these memoirs, which had employed so much of his time, and which gave rise to so many important speculations, Young established himself in London, attending the hospital very closely, and began the practice of his profession, at 48 Welbeck Street, where he remained for five and twenty years, spending his summers near Brighton, a place much visited by good society.

It was a fortunate circumstance for the fame of Dr. Young that he never gained much practice as a physician; and though some of the best years of his life were diverted to professional duties and occupations, he was enabled to devote many more to those literary and scientific pursuits in which few could compete with him. Some one has remarked that the practical withdrawal of Young from the scientific world during sixteen years was a great loss to the progress of natural philosophy, while the absence of that suavity of manner when dealing with patients which is so essential to the success of a physician prevented him from acquiring a valuable practice. In fact, Young was too much of a philosopher in his behavior to succeed as a physician; he thought too deeply before giving his opinion and diagnosis, instead of appearing to know all about the subject before he commenced his examination, and this habit which is essential to the philosopher does not inspire confidence in the practitioner.

Upon his "Memoir on the Mechanism of the Eye," he put forth all his powers, and he has quite justly been called the "Founder of Physiological Optics." The optical and anatomical investigations which it contains are of no ordinary difficulty and importance, more especially the adaptation of the optometer, originally invented by Dr. Porterfield for accurately measuring the focal distance of the eye both in the vertical and horizontal planes; the determination of the refractive power of a variable medium, and its application to the constitution of the crystalline lens; the indication of the nice and accurate adjustment of every part of the eye for viewing at the same time the greatest possible range of objects without confusion; the measurement of the collective dispersion of colored rays in the eye; and ingenious and multiplied experiments for ascertaining, in some cases beyond the reach of controversy, what parts of the eye are changed and what are not, when passing from the view of near, to distant objects, and conversely.

SIR ISAAC NEWTON
(1642–1727)

Young took advantage of his own near-sightedness to study the asymmetry of the dioptric system of the eye. With the phorometer he discovered that the cross lines could not be seen equally clearly, simultaneously, but required separate focusing. And, he had noticed that near-sighted persons by tilting their glasses could correct a certain amount of astigmatism. He correctly observed, also, that inequalities in the radii of the crystalline lens accounted for some of the astigmatism present in eyes which could not be perfectly corrected by spectacles.

In 1808 Young accepted the office of Professor of Natural Philosophy at the Royal Institution. The lectures which he gave there were afterwards published, and were divided into three parts. The first including mechanics, theoretical and practical; second, hydrostatics, hydrodynamics, acoustics and optics; the third, astronomy, the theory of the tides, the properties of matter, cohesion, electricity and magnetism, the theory of heat and climatology. They form the most comprehensive system of natural philosophy that has ever been published in England. They are a mine of information, and it is well known that many important propositions and discoveries have been more or less clearly indicated in them which have been recognized or pointed out when other philosophers discovered them independently or announced them as their own. Young likened himself to Cassandra who always told the truth, but was seldom understood, and never believed.

It is not possible for me to do more than merely refer to the undulatory theory of light discovered and announced by Fresnel, the French engineer, who did what Young could not—make known Young's theories, and have them received by the scientific men of Europe—and who so handsomely acknowledged Young's primacy of discovery; while maintaining the independence and originality of his own methods. Those who desire to pursue the subject may do so in Young's own writings, or in the lucid statement of the whole matter in Whewell's "History of the Inductive Sciences."

Nor may I here enter into any detail of Young's "Theory of Color-Vision," except to state that he first explained color sensation as due to the presence in the retina of structures which respond to the three colors, red, green and violet respectively, and color blindness as due to the inability of one or more of these structures to respond normally to stimulus. Let this tribute from Helmholtz, who supported and extended Young's theory, from his lectures on "The Recent Progress on the Theory of Vision" suffice:

> The Theory of Colors, with all its marvelous and complicated relations was a riddle which Goethe in vain attempted to solve; nor were we physicists and physiologists more successful. I include myself in the number; for I, long worked at the task without getting any nearer my object, until I, at last, discovered that a wonderfully simple solution had been presented at the beginning of the century and had been in print ever since for anyone to read who chose. This solution was found and published by the same Thomas Young, who first showed the right method of arriving at the interpretation of Egyptian hieroglyphics. He was one of the most acute men who ever lived, but had the misfortune to be too far in advance of his contemporaries. They looked on him with astonishment, but could not follow his bold speculations, and thus a mass of his most important thoughts remained buried and forgotten in the Transactions of the Royal Society, until a later generation by slow degrees arrived at the rediscovery of his discoveries, and came to appreciate the force of his arguments and the accuracy of his conclusions.

So much of Dr. Young's scientific work has been mentioned here because it was during his early years of professional practice that his most original scientific work was accomplished. In 1808 was published his famous Croonian lecture to the Royal Society "On the Functions of the Heart and Arteries," in which the laws regulating the flow of blood through the body are clearly stated. After two years tenure of the Natural Philosophy Chair at the Royal Institution, Young resigned because his friends were of the opinion that its tenure militated against his prospects as a physician. In the summer of 1802, he escorted the great nephews of the Duke of Richmond to Rouen, and took the opportunity of visiting Paris.

In March, 1803, he took his degree of M.B. at Cambridge; and, on June 14th, he married Eliza, daughter of J. P. Maxwell, Esq., whose country seat was near Farnsborough. For sixteen years after his marriage, Young resided at Worthing during the summer, where he had a very respectable practice, returning to London in October or November.

He took his degree of M.D., in 1808, and soon after was admitted Fellow of the College of Physicians. In January, 1811, he was elected one of the physicians of St. George's Hospital, which appointment he retained for the rest of his life. In this capacity his practice was considerably in advance of the time, for he regarded medicine as a science rather than an empirical art, and his careful methods of induction demanded an amount of attention which medical students, who preferred the more rough and ready methods then in vogue were slow to give. The apothecary of the hospital stated that more of Dr. Young's patients went away cured than of those who were subject to the more fashionable treatment; but his private practice, notwithstanding the sacrifice he made, never became very valuable. He delivered a course of lectures at the Middlesex Hospital, but he had small audiences, as the tax which they made upon the brains of the hearers was too great for most students. He expanded them and published them in 1813 as an "Introduction to Medical Literature" —a work of great labor.

The last of his medical publications was "A Practical and Historical Essay on Consumptive Diseases," which appeared in 1815. It is a condensed and admirably arranged abstract of everything that had been said and done with regard to consumption. Knowing that the public is apt to hold in light esteem a professional man who concerns himself with studies and pursuits apart from his special line, Dr. Young withheld his name from his published papers, whether original or translated, in general science. Later he was appointed on Government Commissions for various purposes, especially concerning the introduction of gas in London, the income from which rendered him more independent of his practice, and he became less careful to publish his scientific papers anonymously.

In the years between 1820 and 1825, he traveled on the Continent, meeting famous persons and returning visits. In the year 1828 he removed from his house in Welbeck Street to another in Park Square which he had built under his own directions and fitted up with great elegance and taste. He had studied from an early period of his life, to adapt his habits to those of cultivated and refined society, and found a greater relief from his severe studies in the lively conversation and elegant announcements of accomplished women than in the graver discussions of those who are brought into contact with each other by a common unity of scientific, literary or political interests. His language was correct and his utterance rapid. In his earliest writings his style was marked by an obscurity which became less as he developed. His lectures, on the contrary, were characterized as a "mine of good things happily expressed." In August, 1827, he was elected one of the eight foreign associates of the Academy of Sciences, at Paris, in place of Volta, the highest honor that could be conferred on a man of science.

In February, 1829, his health began to give way and by April his friends and physicians became alarmed at his symptoms. Though under the pressure of severe illness, nothing could surpass the kindness of his affection to all around him. He had completed all the works on which he was engaged with the exception of the rudiments of an Egyptian dictionary. He not only continued to give directions concerning it, but labored at it with pencil, when confined in bed as he was unable to hold a pen. He declared to one who would hinder him, that he had never spent an idle day in his life.

His illness continued with some slight variations, but he was gradually sinking into greater and greater weakness, till the morning of the 10th of May when he expired without a struggle, having hardly completed his fifty-sixth year. The disease proved to be an ossification of the aorta, which must have been in progress for many years. His remains were deposited in the Parish Church at Farnsborough.

As a physician, a linguist, and archaeologist, a mathematician, scholar, and philosopher in the most difficult and abstruse investigations, Thomas Young has added to almost every department of human knowledge that which will be remembered in after times. In a review of Peacock's "Life of Young," which was published in 1855, Milburn, in 1890, wrote:

> When we consider the grandeur of his genius, the multifarious greatness of his works, the simplicity and sublimity of his character, we are amazed at the indifference of mankind which has suffered his name to rest in comparative obscurity.

For many years, Young's works were neglected by his countrymen. Up to 1860, few in England seemed to have remembered his contribution, "On the Mechanism of the Eye," which was published in the *Philosophical Transactions* in 1801. In those papers he described the various properties of the lens and demonstrated the contractility of the lens fibers. And, sad to tell, most ophthalmologists have learned of him through Tscherning's "Œuvres Ophtalmologiques de Thomas Young," a collection of translations made and edited with great sympathy, published in 1894. All of us know with what high praise Donders viewed Young's investigations into the mechanism of accommodation, and how strongly he attests the restatement by Helmholtz of Young's observation that it depended upon the change of form of the crystalline lens.

Young was well formed in person and took great delight in lively exercise. He was always ready to take his part in a dance or a glee, or to join in any scheme of amusement calculated to give life and interest to a party. His colleagues at the Royal Institution regarded him as a most amiable and good tempered man, indeed, probably as a consequence of his early training his temper had always been remarkably even, and, in his friendships, and in his domestic life he was singularly happy.

From a short memoir written by a devoted, life-long friend, Mr. Gurney, founded upon an autobiography which Young had prepared, I will conclude with this passage:

> To sum up the whole with that which passes all acquirements, Dr. Young was a man in all the relations of life, upright, kindhearted, blameless. His domestic virtues were as exemplary as his talents were great. He was entirely free from either envy or jealousy, and the assistance which he gave to others engaged in the same lines of research with himself was constant and unbounded. His morality through life had been pure, though unostentatious. His religious sentiments were by himself stated to be liberal, though orthodox. He had extensively studied the Scriptures, of which the precepts were deeply impressed upon his mind from his earliest years. And he evidenced the faith which he professed in an unbending course of usefulness and rectitude.

And, from the inscription on his monument in Westminster Abbey—

> A man alike eminent in almost every department of human learning,
> Endeared to his friends by his domestic virtues,
> Honored by the world for his unrivalled acquirements,
> He died in the hope of the resurrection of the Just.

In my mind, I delight to muse over the time when Science was struggling to raise its head in the various countries. In England, by the time the truth of the discovery of America had become settled in men's minds as an accomplished fact, instead of seeking the "gold and spices of the East," to add to their luxuriousness, there arose the spirit of colonization with all its hardships and its freedom. I fancy that the sailing away of ships, to be lost in the West, gave rise to the speculations which ended in Newton's conception of the shape of the world and its place among the planets; and, out of such speculations the world began to be, as it were, born anew.

When the dominating genius of Henry VIII, and the strong rule of Elizabeth had passed, their influence gave place to a period of transition from mediaevalism to modern times. The "Period of the Stuarts," is one of unending and great fascination, in science as well as in literature and in politics. The study of "Science," as distinct from "Literature," was only in its infancy; it still held the allurement of a subject just becoming specialized. All sorts of wonderful ideas crowded in upon men's minds; theories, which for long had hung as hazy ideas in the air, now became proved facts, and the close of the Stuarts dynasty found the nation highly sensitive to new impressions, and that age is especially famous for its development of Science.

The years succeeding the accession of Charles II, were memorable years for scientists. England followed the example set by the continent of Europe, and the genius of the race for the moment expressed itself almost entirely in science. In the very year of Newton's birth, a group of thoughtful men met together once a week, despite the turbulence of Royalists, Independents, Roundheads and others, to discuss all sorts of subjects, from the circulation of the blood to the position of the planets. These meetings were continued uninterruptedly until, in 1662, Charles II, recognized the foundation of the Royal Society, and from that date Science became a separate, definite branch of knowledge.

It is to the fostering care of the spirit of the Royal Society that the science of ophthalmology owes its foundation in the understanding of the purposes of the eye—the organ of vision—as an optical instrument. And it is to the memory of four heroic workers who were Fellows of the Royal Society, that I would dedicate the time we have spent together to-night.

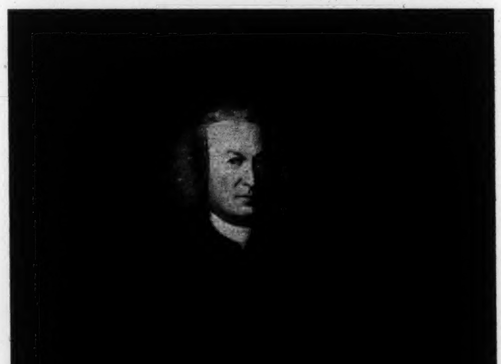
THE EARLY HISTORY OF ANATOMY IN THE UNITED STATES

BY EDWARD B. KRUMBHAAR, PH. D., M. D.

Associate Professor of Applied Pathology, Graduate School of Medicine
University of Pennsylvania

FROM THE LABORATORIES OF THE PHILADELPHIA GENERAL HOSPITAL

IN as young a country as the United States, it is a comparatively easy matter to trace the growth of a science from its earliest beginning, and medicine is no exception to this rule. Thus we know the name of the first physician in the first permanent settlement in this country;[1] the doctor who accompanied the Pilgrims on the Mayflower in 1620;[2] the first Zieckentroosters or visitors of the sick in the Dutch colony of New York;[3] the three Welsh physicians who in 1682 came with William Penn in the Welcome to found Philadelphia and his colony of Pennsylvania;[4] and the author of the first medical work published in the United States.[5] The health of the struggling young communities was necessarily cared for at first by the more educated leaders, by midwives, by visiting ship's surgeons and by the few medical practitioners that had come from the mother country as colonists. But from the earliest times the need for occasional postmortem examinations and for learning the structure of the body from actual dissections ("Making an Anatomy"—in the quaint old term), rather than from book learning or didactic lectures, was well recognized. The difficulty of procuring anatomical material, which then existed throughout the civilized world, was most aggravated in the young, healthy and sparsely settled country; thus Eliot, the Apostle to the Indians, as early as 1647, expresses in a letter to Mr. Thomas Shepard, the Cambridge minister,[6] his desire that "our young Students in Physick may bee trained up better then yet they bee, who have only theoreticall knowledge, and are forced to fall to practice before ever they saw an Anatomy made, or duely trained up in making experiments, for we never had but one Anatomy in the Country, which Mr. Giles Firman (Firmin) (now in England) did make and read upon very well." In passing, it might be noted that Mr. Firmin found the outlook for the practice of physics in the new country so discouraging that he returned to England to take up the more lucrative study of divinity! The apostle's desire seems to have carried weight, as we find the following resolution passed within a month by the General Court of Massachusetts: "We conceive it very necessary y^{t} such as studies physick or chirurgery may have liberty to reade anotomy (*sic*) and to anotomize once in foure yeares some malefactor in case there be such as the Courte shall alow of."[7] In the same letter to Shepard, Eliot says, "I have shown them (i. e. the Indians) the anatomy of man's body," but Hartwell[8] thinks that Eliot probably never performed any dissections himself. The need for first-hand knowledge must have indeed been great—quackery was already rife, and the education of the practitioners often woefully lacking. Thus, in Judge Samuel Sewell's diary of September 22, 1676:[9] "Spent the day from nine in the morning with Mr. (Dr.) Brakenbury, Mr. Thomson, Butter, Hooper, Cragg, Pemberton, dissecting the middle-most of the Indians executed the day before. X., who taking the heart in hand, affirmed it to be the stomach." Packard[10] gives the record of six different autopsies reported in New England between the years 1674 and 1678, and Hartwell quotes from a Maryland Order of Council[11] what may well be the earliest autopsy performed in this country by legal direction. In 1691, the celebrated autopsy on Governor Slaughter of New York was made, which for a long time was erroneously considered to be the first recorded autopsy in this country. Governor Slaughter having incurred several severe enmities following the execution of a rioter, it was suspected that his sudden death might be due to poisoning. Dr. Johannes Kerfbyle,[12] assisted by five physicians, was therefore ordered by the Council to examine the body and reported that he "died of a defect in his blood and lungs occasioned by some glutinous tough humor in the blood, which stopped the passage thereof and occasioned its settling in the lungs." This, Walsh,[13] who gives an excellent description of the event, has ingeniously suggested to be the seventeenth century manner of describing a pulmonary embolism. From such accounts we may infer that in several of the American colonies at least, a post-mortem examination to determine the cause of death was not an uncommon occurrence in the seventeenth century. Of much later date (1750) was the well-known injection and dissection, by Drs. Thomas Bard and Peter Middleton of New York, of the body of Hermannus Carroll, an executed criminal, "for the instruction of the young men then engaged in the study of medicine." Walsh states that they had offered a private course in anatomy before this date, but I do not know on what authority this statement is based.

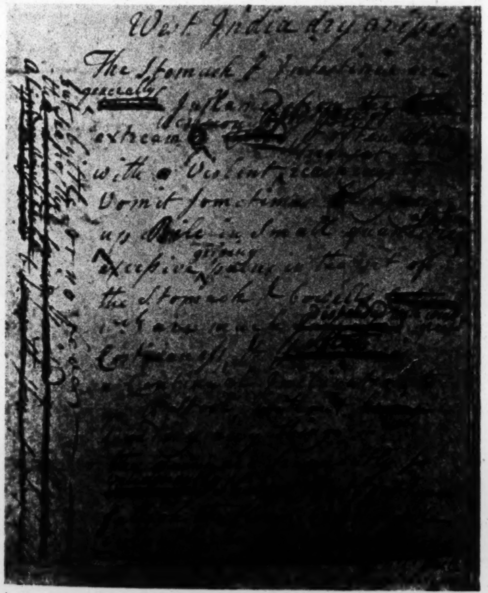


Portrait of Thomas Cadwalader (1708–1779) in Possession of the Pennsylvania Hospital. The Original, by Charles Wilson Peale in 1770, is Owned by John Cadwalader of Philadelphia.

Laudable and necessary as such efforts were, however, their benefits were mostly individual and evanescent, and it is to a different source that we must turn for the work that may be said to have initiated the scientific study of anatomy in the American colonies. The credit for this achievement may fairly be given to Dr. Thomas Cadwalader, one of the most notable Philadelphia physicians of the eighteenth century.

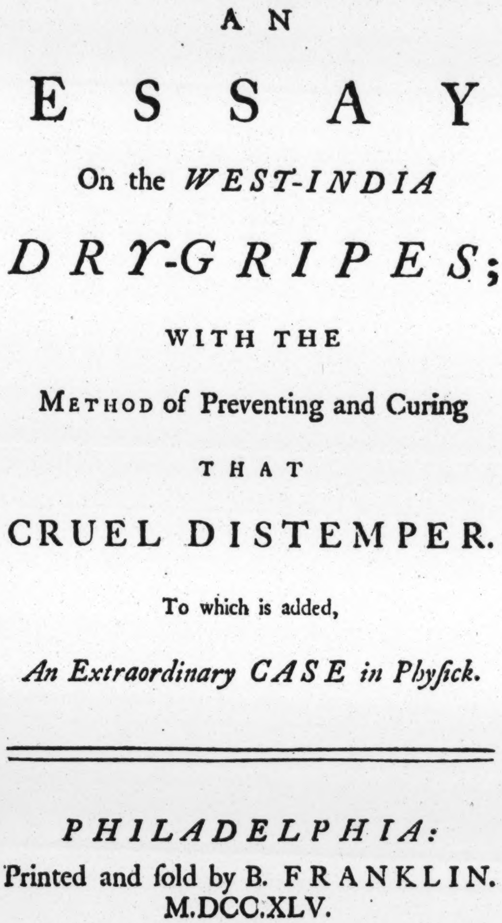
Thomas Cadwalader[14] (1707/8–1779) was the son of John Cadwalader, who emigrated from Wales in 1689, and Martha the daughter of Dr. Edward Jones. Having studied in the Friends "Publick" School (now the Penn Charter School), he was apprenticed at the mature age of eighteen for two years to his uncle, Dr. Evan Jones. He is thus doubly directly connected with the founding of the city, through two great-grandfathers: John Jones, who came over with Penn in 1699 and Dr. Thomas Wynne, one of the original settlers, the father-in-law of his grandfather, Edward Jones. To complete his medical education, he was sent to the University of Rheims and to England, where he studied under the celebrated William Cheselden, of whom Pope wrote, "I'll do what Mead and Cheselden advise, to keep these limbs and to preserve these eyes." Here presumably he learned the art of dissection, which was soon to stand him in such good stead. Shortly after his return from Europe (probably in 1730), he was known to be "so proficient in dissection, at that time rare in Europe and unknown in America, that students and physicians alike urged him to give a public course of lectures on the cadaver." Caspar Wistar[15] says: "According to correct information I find that on his return to Philadelphia he made dissections and demonstrations for the instruction of the elder Dr. Shippen and some others, who had not been abroad." These demonstrations were given in a building on the back part of a lot on Second Street above Walnut, where later stood the old Bank of Philadelphia.[16] In Caspar Wistar's words, "this probably was the first business of the kind ever done in Pennsylvania." The impression that this event made in the mind of the elder Shippen was undoubtedly an important factor in sending his son to England for his medical education, which, as we shall later see, was the direct cause of the first scholastic teaching of anatomy in the American colonies.

Though nothing more is known of Cadwalader's anatomical dissections, he is known to have utilized his skill in this art throughout his career in the performance of autopsies. Thus, in his celebrated work on lead poisoning,[17] there are numerous notes of post-mortem observations and the "extraordinary case in physics" is a clinicopathological report of a peculiar bone disease in a cured diabetic, written much in the modern style. It is not necessary or appropriate in this place to enumerate the various distinctions and honors that came to him in his long career through an eventful period of our history; nor to attempt to describe his personal charm, as exemplified in the well-known story of the demented Lieut. Bruluman in search of other game than that with which the Commons (now City Hall Plaza) then abounded. One anecdote, recently told me by a descendant, I may be permitted to relate, as it has never to my knowledge appeared in print and throws an interesting light both on the man and his times. It seems that for some little time travelers along the Blockley (now Montgomery) Pike had been bothered by ghosts in the old Merion (Quaker) meeting churchyard (founded in 1683). Dr. Cadwalader therefore decided to investigate the



West India dry gripes

A PAGE OF THOMAS CADWALADER'S MANUSCRIPT OF "AN ESSAY ON THE WEST-INDIA DRY-GRIPES."



AN

ESSAY

On the *WEST-INDIA*

DRY-GRIPES;

WITH THE

METHOD of Preventing and Curing

THAT

CRUEL DISTEMPER.

To which is added,

An Extraordinary CASE in Phyſick.

PHILADELPHIA:

Printed and ſold by B. FRANKLIN.
M.DCC.XLV.

TITLE PAGE OF CADWALADER'S "ESSAY ON THE WEST-INDIA DRY-GRIPES." THE COPY IN THE LIBRARY OF THE COLLEGE OF PHYSICIANS IS UNIQUE IN HAVING TWO PREFACES.

problem by spending the night on the premises, which were some six or eight miles from town. When the white apparition of the ghost appeared the worthy doctor gave chase around the graveyard and finally caught him, when he turned out to be a harmless lunatic at large.

Cadwalader's achievements in dissection and in morbid anatomy were the more noteworthy on account of the low level on which medicine stood in the colonies in the first half of the eighteenth century. Quacks were said to "abound like the locusts in Egypt" and complaints about charlatanism are only too numerous in the writings of the time. It is to be feared that the scurrilous words of Douglass,[18] a notable Scotch physician, who settled in Boston in 1718, have more than a modicum of truth:

> In our plantations, a practitioner, bold, rash, impudent, a lyar, basely born and uneducated, has much the advantage of an honest, cautious, modest gentleman. In general, the physical practice in our Colonies is so perniciously bad, that excepting in surgery and some acute cases, it is better to let nature take her course than to trust to the honesty and sagacity of the practitioner; our American practitioners are so rash and officious that the saying of the Apocrypha may, with propriety, be applied to them; "He that sinneth before his maker, let him fall into the hands of the physician." Frequently there is more danger from the physician than from the distemper.

In the latter half of the century, however, things medical were taking a distinct turn for the better. Not only did the growing wealth and strength of the colonies permit an ever-increasing number of ambitious students to visit the schools of Vienna, London and Edinburgh, in order to secure a scientific foundation for their medical studies, but also by the French and Indian wars many medical men of superior education were brought to the colonies. In the words of Dr. Nicholas Romaine:[19]

> The war which effected the conquest of Canada, was, perhaps, the first circumstance which materially improved the condition of medicine in this State (New York). The English army employed for that purpose, left Europe, accompanied by a highly respectable medical staff, most of whom landed in the city of New York, and continued some years in the neighboring territories, affording to many young Americans opportunities of attending the military hospitals, and receiving such professional instruction as gave them afterward consideration with the public. The physicians and surgeons of the Anglo-American army gained the confidence of the public, by their superior deportment and professional information. The military establishments in this State, after the Canadian war, required medical and surgical attendants, so that the people had the benefit of their advice. In this manner a new order of medical men was introduced into the Community.

Without the aid of medical schools, those who could not afford to go abroad, and many who could, acquired their training through the apprentice system, a method that was not without its advantages and which was at this time extensively followed in Europe as well. The young aspirant, after serving an appropriate time under indenture as the physician's technical—and often menial—assistant, thus acquired considerable skill in medical practice and in the necessary adjunct of pharmacy, but had little opportunity to study the underlying sciences. That these apprenticeships were no sinecure is shown by John Bard's service with the churlish Dr. Kearsley for seven years, beginning when he was fourteen. Benjamin Rush started with John Redman at fifteen and served for six years, and James Lloyd of Boston served with Clark for five years, beginning at the advanced age of seventeen. Though not especially connected with the teaching of Anatomy, a word at this point as to the flourishing condition of medicine in the Southern colonies of the eighteenth century seems desirable. In Charleston, especially, Lining, Moultrie, Chalmers and Garden formed a noteworthy group and the last named, with Mitchell of Virginia, constituted two of the fourteen American colonial Fellows of the Royal Society.

The earliest printed announcement of lectures on anatomy in this country was apparently that of Thomas Wood, Surgeon, who placed the following advertisement in the New York Weekly Postboy of January 27, 1752:[20]

> Whereas Anatomy is allowed on all Hands, to be the Foundation both of PHYSICK and SURGERY, and consequently, without SOME knowledge of it, no person can be duly qualified to practice either: This is therefore to inform the Publick, That a COURSE of OSTEOLOGY and MYOLOGY, is intended to be begun, some Time in February next, in the City of New Brunswick, (for which Notice will be given in this Paper, as soon as a proper number have subscribed towards it). In which Course, all the human BONES will be separately examined, and their Connections and Dependencies on each other demonstrated; and all the MUSCLES of a human BODY dissected; the Origin, Insertion, and Use of each plainly shown. This Course is proposed to be finished in the Space of a Month.
>
> Thomas Wood, Surgeon.
>
> Such Gentlemen who are willing to attend this Course, are desired to subscribe their Names as soon as possible, with Mr. Richard Ayscough, Surgeon, at New York or said Thomas Wood, at New Brunswick, paying at the same Time, THREE POUNDS, Proc. and engaging to pay the said Sum of Three Pounds more, when the Course is half finished.
>
> N. B. If proper Encouragement is given in this Course, he proposes soon after, to go thro' a Course of ANGIOLOGY and NEUROLOGY; and conclude, with performing all the OPERATIONS of SURGERY, on a dead body: The Use of which will appear to every Person, who considers the Necessity of having (at least) SEEN them performed, before he presumes to perform them himself on any living Fellow Creature.

Although this advertisement was subsequently repeated on several occasions in the same journal, I have been unable to find the notice mentioned, so do not know whether one or both courses were given, or if begun, how long they were continued. Wood's lectures, if given, antedated by two years the better known course of lectures on anatomy and comparative anatomy, given by William Hunter in Newport in 1754 to 1756. Hunter,[21] a Scotchman, born in 1720, was said to be a relative of his more famous namesake. Educated at Edinburgh under the elder Munro, and at Leyden, he came to Rhode Island in 1752 and quickly attained a position of prominence in the community. His medical library, at that time said to be the largest in New England, was mostly dispersed by accidents of the Revolution; but his manuscript lectures were still said to be in existence at a much later date, and his portrait still exists in the possession of a descendant of the same name, who is now employed in the United States Department of State.

While these sporadic efforts apparently complete the narrative of prescholastic instruction in anatomy in the American colonies, the record should not be considered discreditable in the light of the relatively immature state of that science in the home countries at that time.[22] Even on the Continent, where the study of Anatomy was most advanced, the Theatrum Anatomicum of Berlin was not founded till 1713 and the Vienna theatre in 1718, and the latter was practically without dissections till 1741. In Strasburg, Salzmann had daily dissections with three weekly demonstrations in 1708; but Haller, in Tubingen, was forced to study on dogs, and in Paris, on one occasion, fled for his life from a body-snatching episode. The celebrated Albinus averaged but one dissection a year at Leyden, Friedrich Hoffmann but twenty in twenty-four years at Halle; while in Prague there were but three dissections between 1692 and 1712. The earliest chairs of anatomy in England were all founded in the eighteenth century (Edinburgh, 1705; Cambridge, 1707; Glasgow, 1718; the Oxford lectureship, 1750*; Dublin, 1785).

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* According to A. Chaplin (Contributions to Medical and Biological Research, Dedicated to Sir William Osler, 1919, i, 16), the Lee lectureship in Anatomy at Christ Church, Oxford, was founded in 1762.

We now come to a more important and protracted effort in anatomical education, and of greater significance, as it led directly to the foundation of the first medical school in the American colonies. William Shippen, Sr., impressed with the advantages—denied to him—of a European education, and following the growing custom of the time, in 1758, sent his son, William, who had already studied physic with him for four years, to London to study anatomy with John Hunter and obstetrics with William Hunter, Smellie and McKenzie. In London young Shippen lived with John Hunter and worked in his home and in William Hunter's Theatre in Covent Garden, the Great Windmill Street School not being started until 1768. He became closely acquainted with the talented William Hewson, three years his junior, and the celebrated Quaker physician, John Fothergill, who had already evinced great constructive interest in the Quaker settlement of Philadelphia and especially in the newly founded (Quaker) Pennsylvania Hospital, the oldest general hospital in this country. Fothergill discussed with both Shippen and John Morgan, the desirability of establishing a medical school in the colonies, and probably had this in mind when, in 1762, he made his famous present to the Pennsylvania Hospital of the eighteen anatomical views and three cases of models.[23] The story of this gift and its influence on medical education has been so fully told elsewhere[24] that it need not be repeated here.

John Fothergill
(1712–1780)

Shippen, after finishing his course under Cullen and Munro secundus and getting his degree at Edinburgh,[25] returned to Philadelphia in May 1762, and the same autumn began the successful course of anatomical lectures, which continued until interrupted by the Revolution in 1777. In the *Pennsylvania Gazette* of November 11, 1762, he issued the prospectus of his lectures, of which the introductory lecture was given at the State House on the 16th. Subsequent lectures were given in a building erected for the purpose in the rear of his father's residence on Fourth Street, and were doubtless largely based on the "curious Anatomical Casts and drawings, presented by the judicious and benevolent Doctor Fothergill," which the managers of the Pennsylvania Hospital generously loaned. Probably the skeleton presented by Deborah Morris to the Hospital in 1757, also played an important rôle; and in December the body of a negro who had committed suicide became available for dissection, and those of all criminals and suicides for some time thereafter.[26]

By the spring of 1765, Shippen's friend, John Morgan, was ready to return to America "to see whether, after fourteen years' devotion to medicine, I can get my living without turning apothecary or practicing surgery." But he had still weightier projects in hand, and before leaving Europe, he had already prepared a written Plan, which had the approval of the Hunters, Cullen, Fothergill and others, for the formation of a medical faculty in the flourishing young College of Philadelphia. This, with a letter of presentation to the Board of Trustees from Thomas Penn, proved so efficacious that on May 3, 1765, he was unanimously elected Professor of the Theory and Practice of Physic and the next September, in response to Dr. Shippen's "application" by letter, the latter was unanimously elected Professor of Anatomy and Surgery:

The instituting of medical schools in this country has been a favorite object of my attention for seven years past, and it is three years since I proposed the expediency and practicability of teaching medicine in all its branches in this city, in a public oration read at the State House, introductory to my first course of Anatomy. I should have long since sought the patronage of the Trustees of this College, but waited to be joined by Dr. Morgan, to whom I first communicated my plan in England and who promised to unite with me in every scheme we might think necessary for the execution of so important a point.

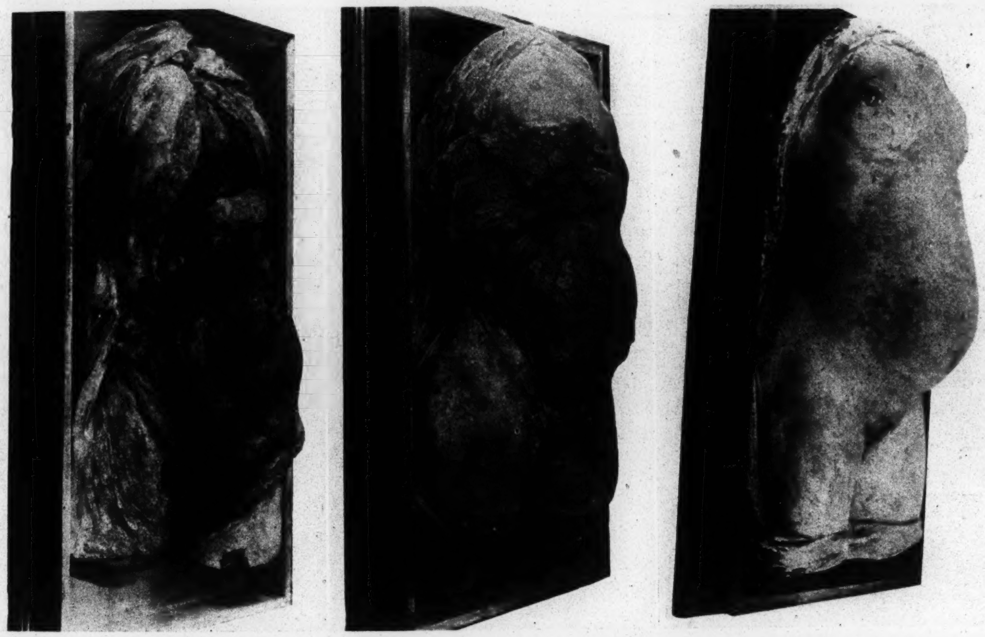
I am pleased, however, to hear that you gentlemen, on being applied to by Dr. Morgan, have taken the plan under your protection and have appointed that gentleman Professor of Medicine.

A professorship of Anatomy and Surgery will be gratefully accepted by, gentlemen, your most obedient and humble servant.

WILLIAM SHIPPEN, JR.

Philadelphia, 17th September, 1765.

On September 26th, the prospectus of the newly founded Department appeared in the *Pennsylvania Gazette* and on November 14th, Shippen began the first course of lectures given in a medical school in this country. The joint announcement read as follows:



THE GYPSUM CASTS WHICH FOTHERGILL PRESENTED TO THE PENNSYLVANIA HOSPITAL.

As the necessity for cultivating medical knowledge in America is allowed by all, it is with pleasure we inform the public that a Course of Lectures on two of the most important branches of that useful science, viz., Anatomy and Materia Medica, will be delivered this winter in Philadelphia. We have great reason, therefore, to hope that gentlemen of the Faculty will encourage the design by recommending it to their pupils, that pupils themselves will be glad of such an opportunity of improvement, and that the public will think it an object worthy their attention and patronage. In order to render these courses the more extensively useful, we intend to introduce into them as much of the Theory and Practice of Physic, of Pharmacy, Chemistry, and Surgery as can be conveniently admitted.

From all this, together with an attendance on the practice of the physicians and surgeons of the Pennsylvania Hospital, the students will be able to prosecute their studies with such advantage as will qualify them to practice hereafter with more satisfaction to themselves and benefit to the community.

The particular advertisements inserted below specify the time when these lectures are to commence, and contain the various subjects to be treated of in each course, and the terms on which pupils are to be admitted.

William Shippen, Jr., M. D.
Professor of Anatomy and Surgery in the College of Philadelphia

John Morgan M. D., F.R.S., Etc.
Professor of Medicine in the College of Philadelphia

Dr. Shippen's course of anatomical lectures will begin on Thursday, the 14th of November, 1765; it will consist of about sixty lectures, in which the situation, figure, and structure of all parts of the human body will be demonstrated on the fresh subject, their respective uses explained, and their diseases, with the indications and methods of cure, briefly treated of; all the necessary operations of Surgery will be performed, a course of bandages given; and the whole concluded with a few plain and general directions in the practice of midwifery. Each person to pay six pistoles.

William Shippen, Jr. (1736–1808), the First Professor of Anatomy in British America.

Those who incline to attend the Pennsylvania Hospital and have the benefit of the curious anatomical plates and casts there, to pay six pistoles to that useful charity.

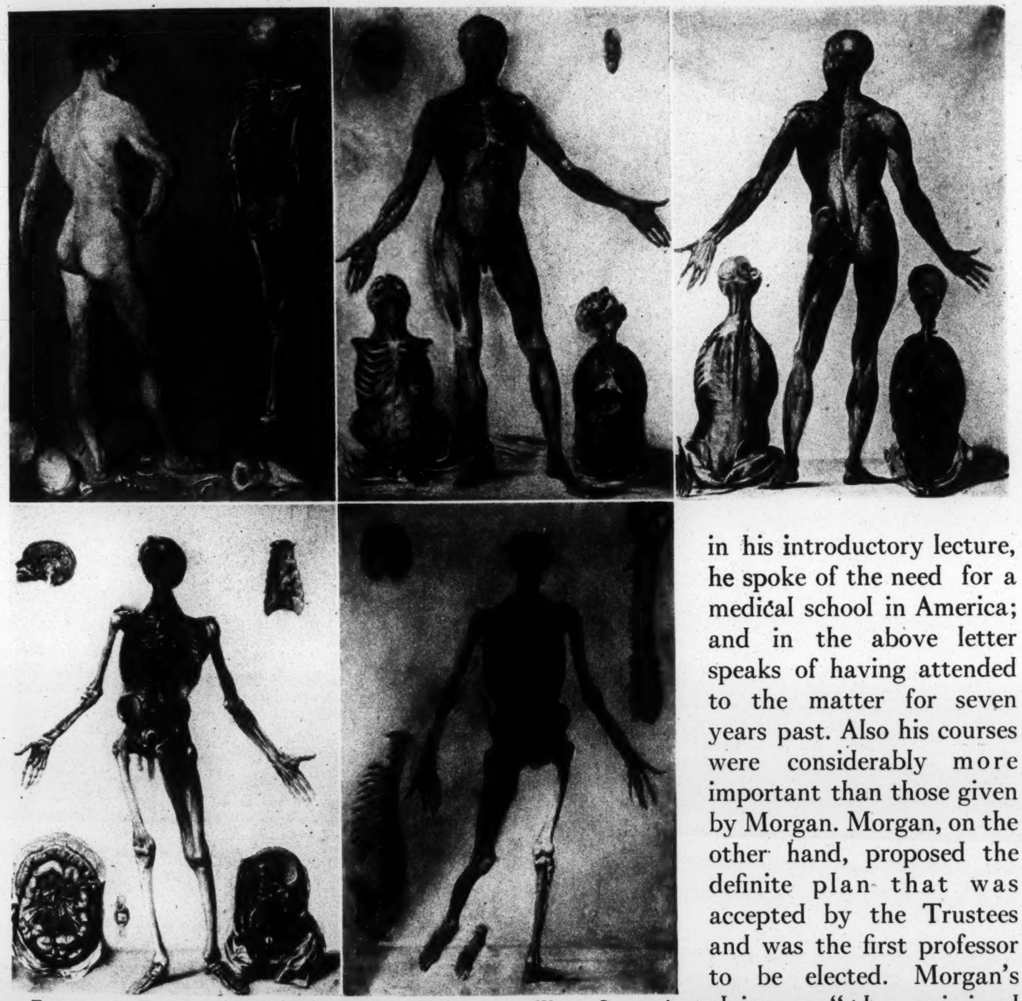
A course of lectures on the Materia Medica by John Morgan, M.D., etc. Price four pistoles.

This course will commence on Monday, the 18th day of November, and be given three times a week at the College, at three o'clock in the afternoon, till finished, which will last between three and four months.

To render these lectures as instructive as possible to students of physic, the Doctor proposes, in the course of them, to give some useful observations on Medicine in general, and the proper manner of conducting the study of physic. The authors to be read in the Materia Medica will be pointed out. The various substances made use of in medicine will be reduced under classes suited to the principal indications in the cure of diseases. Similar virtues in different plants, and their comparative powers will be treated of, and an inquiry made into the different methods which have been used in discovering the qualities of medicines, the virtues of the most efficacious will be particularly insisted upon; the manner of preparing and combining them will be shown by some instructive lessons upon pharmaceutic chemistry. This will open to students a general idea of both chemistry and pharmacy. To prepare them more effectually for understanding the art of prescribing with elegance and propriety, if time allows, it is proposed to include in this course some critical lectures upon the chief preparations contained in the Dispensatories of the Royal College at London and Edinburgh. The whole will be illustrated with many useful practical observations on Diseases, Diet and Medicines.

No person will be admitted without a ticket for the whole course. Those who propose to attend this course are desired to apply to the Doctor at least a week before the lectures begin. A dollar will be required of each student to matriculate, which will be applied to purchase books for a medical library in the College for the benefit of the medical students.

Thus was founded in the American Colonies their first medical faculty, which, through various vicissitudes, continued an uninterrupted course to its present proud position as the Medical Department of the

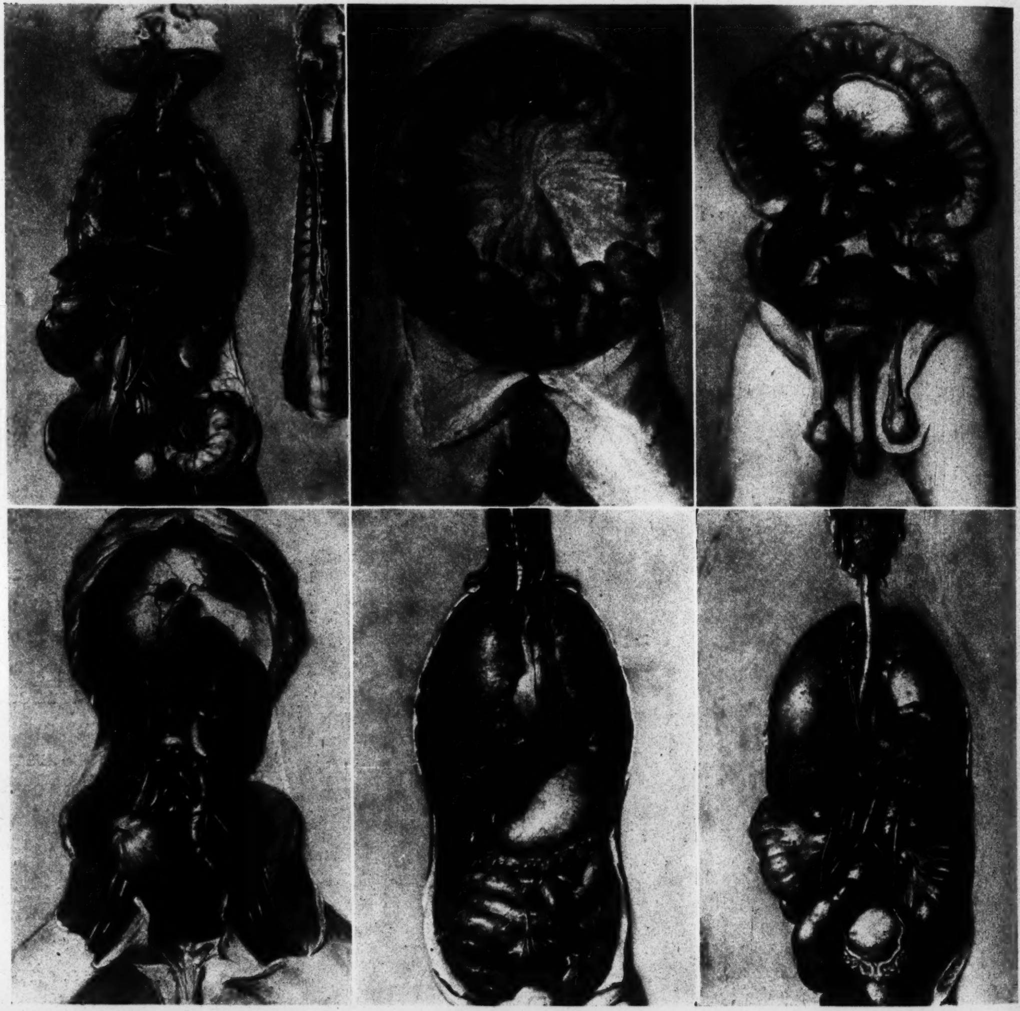


THE FOTHERGILL CRAYONS AT THE PENNSYLVANIA HOSPITAL ON WHICH SHIPPEN'S ANATOMICAL LECTURES WERE BASED

University of Pennsylvania. Since its foundation in 1765, there have been but seven occupants of this chair of anatomy: Shippen, Wistar, Dorsey (five months), Physick, Horner, Leidy and Piersol, truly a long lived and big-minded group! The first degrees (Bachelors of Medicine) were given in 1767, and by statute, three years had to elapse before a thesis could be presented and a doctorate acquired. It is for this reason that the first doctor's degrees were given by the Medical School of King's College, N. Y., which only required a lapse of one year. In awarding the credit for the establishment of our first medical school, there would seem to be plenty for both of the chief actors. Shippen undoubtedly paved the way by his successful courses of anatomical lectures; as early as 1762, in his introductory lecture, he spoke of the need for a medical school in America; and in the above letter speaks of having attended to the matter for seven years past. Also his courses were considerably more important than those given by Morgan. Morgan, on the other hand, proposed the definite plan that was accepted by the Trustees and was the first professor to be elected. Morgan's claim as "the original founder" was never to my knowledge disputed by the gentle, amiable Shippen. They worked together harmoniously on the new faculty, and though in the turmoil of Revolutionary, military medicine, trouble aplenty developed, why question this splendid achievement now?

One more item of the teaching of anatomy in Colonial Philadelphia may be included as a picturesque illustration of the times. In

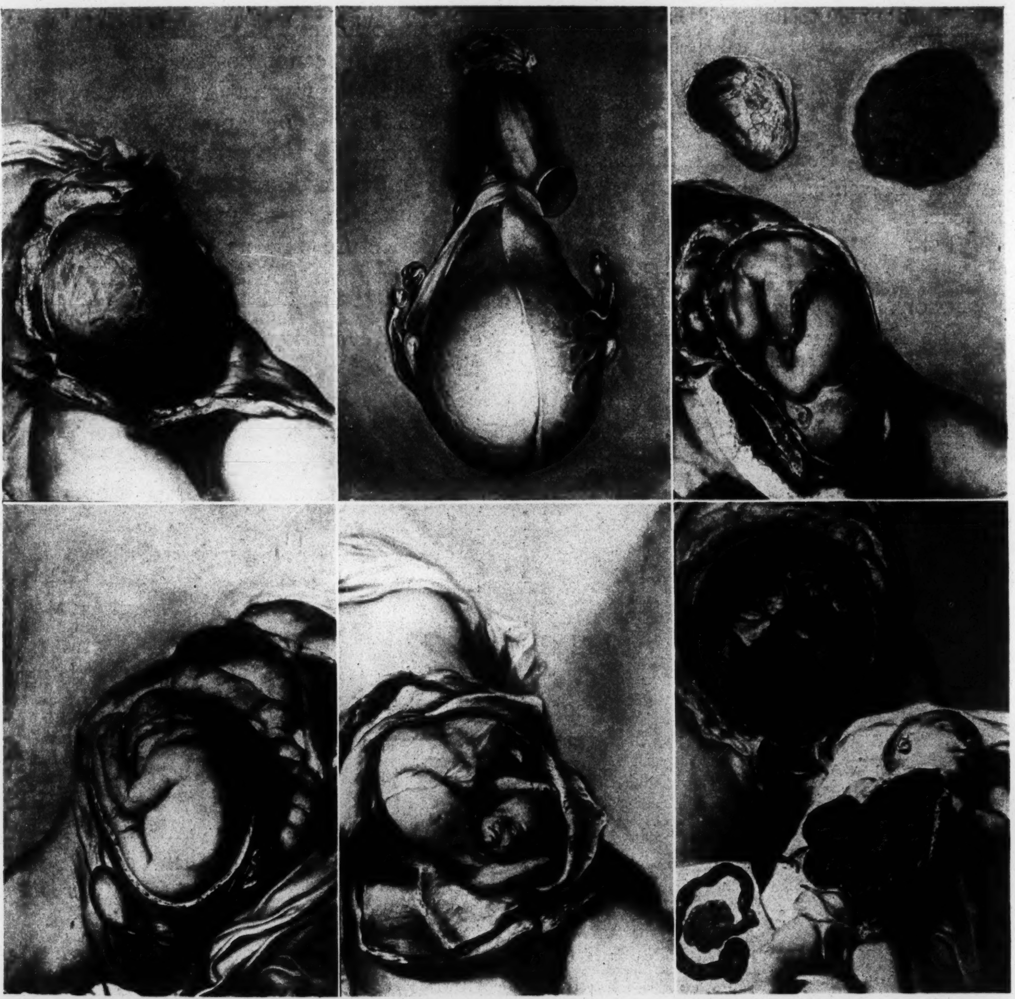
1770, an English anatomist, Dr. Abraham Chovet, was forced by a slave insurrection in Jamaica to flee with his family and settled in Philadelphia. He brought with him a series of wax anatomical models, which, with a collection of dried, injected and painted specimens, formed the basis for a series of anatomical lectures in the winter of 1774–75:



The Fothergill Crayons at the Pennsylvania Hospital on Which Shippen's Anatomical Lectures were Based.

> At the Anatomical Museum in Videl's alley, Second Street, on Wednesday, the Seventh of December at six in the evening Dr. Chovet will begin his course of Anatomical and Physiological Lectures, in which the several parts of the human body will be demonstrated, with their mechanisms and actions, together with the doctrines of life, health and the several effects resulting from the actions of the parts; on his curious collection of Anatomical waxworks, and other natural preparations; to be continued the whole winter until the course is completed. As this course cannot be attended with the disagreeable sight or smell of recent disease and putrid carcases, which often disgust even the students in Physick, as well as the curious, otherwise inclined to this useful and sublime part of natural philosophy, it is hoped this undertaking will meet with suitable encouragement.

Tickets to be had for the whole course at Dr. Chovet's house in Second Street, Philadelphia.



THE FOTHERGILL CRAYONS AT THE PENNSYLVANIA HOSPITAL ON WHICH SHIPPEN'S ANATOMICAL LECTURES WERE BASED.

I cannot find whether these lectures were continued later, but at any rate, in 1793, his heirs sold the collection to the Pennsylvania Hospital as an important addition to their museum. At that time they consisted of eight wax models, ninety-three dried and sixty wet preparations.[27] Chovet's personal peculiarities and anecdotes about his jovial disposition have been so well described by Packard[28] and others that repetition here is unnecessary.

It may be thought that undue attention has thus far been paid to the progress of the study of anatomy in Philadelphia; but it must be recognized that, though in one of the latest colonies to be founded, Philadelphia was then the metropolis of the country,[29] and led the other centers in medicine as it did in various other pursuits. That this is recognized by other than Philadelphians is shown by the following quotation from one of the most charming of our medical essayists,[30] lost to us, alas, in his prime:

> Many (Massachusetts Doctors) went to London and Edinburgh, but more flocked to the Philadelphia school. The foundation of the Harvard Medical School in 1782b y no means

put a stop to those Philadelphia journeys, for it took many years to bring the Harvard School up to the Philadelphia standard. In those days, Philadelphia had this lead over Boston in the advantages it offered medical students, that it provided abundant clinics at the old Pennsylvania Hospital. At Harvard there was no clinic worthy the name. A few patients were shown weekly at the ancient Boston Almshouse, but the school proper was in Cambridge, a two hours journey from Boston then, and the instruction given in Cambridge was altogether didactic.

New York medical progress followed close on the heels of Philadelphia. In 1763 Dr. Samuel Clossy (or Clossey), a graduate of Trinity College, Dublin, who stayed in this country until driven out by the Revolution, gave a course of lectures on anatomy at King's College (now Columbia University), comparable to those started the year before by Shippen in Philadelphia. In 1768 a medical department was started in the same institution, with Clossey as Professor of Anatomy, and among others, John Jones, Professor of Surgery, and the celebrated Samuel Bard (the son of the afore-mentioned John Bard) as Professor of the Theory and Practice of Physic. To Bard, who was considered by Mumford to be with Benjamin Rush the two foremost medical figures of the century, is usually given the chief credit for the foundation of this School.[31]

Organized anatomical instruction in Baltimore began somewhere between 1760 and 1770 with the work of Charles F. Wiesenthal, a Prussian "Medicinae Practicus," who arrived in Baltimore in 1755.[32] In the rear of his house on Gay Street, he erected buildings for his school and dissecting rooms, in which many eminent practitioners were taught until his death 1789. These buildings are still standing in 1922, and will soon have vis-a-vis, the Memorial Building of the Great War recently dedicated by Marshall Foch.

In spite of the advanced state of learning in the New England colonies, and the early start that we have seen made in "Anatomies" and post-mortem examinations, institutional instruction in anatomy seems to have lagged. An Anatomical Society composed of undergraduates, was known to have existed at Harvard in 1771 and to have been in possession of a skeleton, "but their demonstrations were confined to the dissection of appropriate animals," as the examination of a human body was then an extraordinary occurrence even with our most inquisitive anatomists.[33] The first public lecture on Anatomy in Boston was given by John Jeffries (of English ballooning fame) shortly before the outbreak of the Revolution, and it was not until the closing years of the Revolution that in 1782 a medical school was organized in Cambridge.[34] In September, the Corporation of Harvard College adopted the report on the formation of a medical school and on November 22nd appointed John Warren, Professor of Anatomy and Surgery. This he accepted on December 24th, but was not inducted into office until the next October, with Waterhouse as Professor of the Theory and Practice of Physic, and Dexter, a few weeks later, as Professor of Chemistry and Materia Medica. Warren held this chair (which had been founded in 1770 by Ezekiel Hersey with a gift of 1,000 pounds) until his death in 1815.

John Warren,[35] a brother of the Joseph Warren who was killed at Bunker Hill, had served with distinction in various positions in the early days of the Revolutionary War, and on July 1, 1777, when only twenty-two years old, was made Senior Surgeon of the newly established General Hospital in Boston, a position which he occupied until the end of the war. Here, in the winter of 1780, he gave a course of anatomical lectures and dissections to a group of students, physicians and scientific gentlemen, which was so successful that the Boston Medical Society voted that he "be desired to demonstrate a course of anatomical lectures the ensuing winter." This he gave, as well as a third course in

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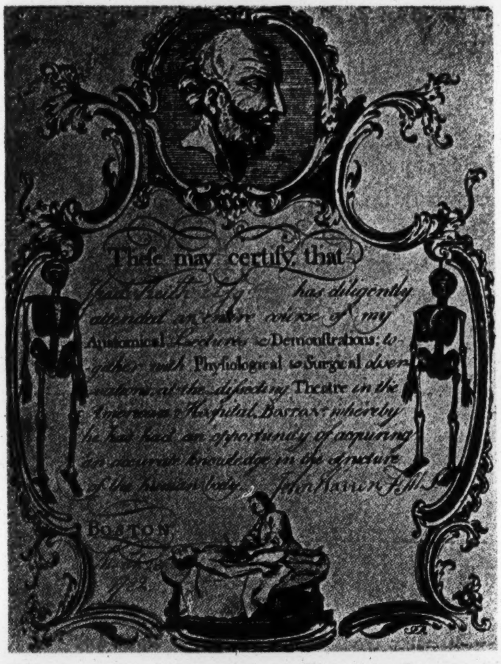
1782, to which the Harvard Seniors were admitted, so that, like his friend Shippen's earlier lectures in Philadelphia, these played an important part in promoting the formation of a Medical faculty at Harvard.

In 1779 Thomas Jefferson had secured a Professorship of Anatomy, Medicine and Chemistry at William and Mary College, which, with the foundation of the Dartmouth Medical School in 1797 by Dr. Nathan Smith, completes the list of eighteenth century medical schools in the United States.

No evaluation of these accomplishments would be correct without due recognition of the obstacles in the way of anatomical investigation in the eighteenth century and even later. For most of this period there was no legal protection for the dissector, and anatomical material was so scarce that it had, as in the home countries, usually to be obtained by "body-snatching." It has already been related how the bodies of executed criminals were occasionally turned over by the authorities for dissection, and Edward Warren tells how in the Boston of his father's time, the Governor, who had the disposal of the body, might assign it to the man's friends or to a surgeon, or permit the prisoner to make his own arrangements for the sale of his own body. This gave rise, in the case of Levi Ames, to a night expedition and a matching of wits that is amusingly described in Warren's life.[36] Before the existence of a Medical School or lecture room, "the back windows of the house were occupied with drying preparations of legs and arms, and other anatomical and morbid specimens, prepared by Dr. Warren, and forming the basis of the Warren Museum, afterwards in the Medical College."

Often more serious events resulted from the prevailing ignorance and horror of dissections. Thus the building in which Shippen's dissections were made was several times attacked, and the Doctor forced to conceal himself; and on one occasion, his waiting carriage was driven off by a shower of missiles and pierced by a musket ball, while he made his escape through a private alley. "Several times he addressed the citizens through the public papers, assuring them that the reports of his disturbing private burying grounds were absolutely false and stating that the subjects he dissected were either of persons who had committed suicide, or such as had been publicly executed; except, he naively adds, 'now and then one from the Potter's Field'."[37]



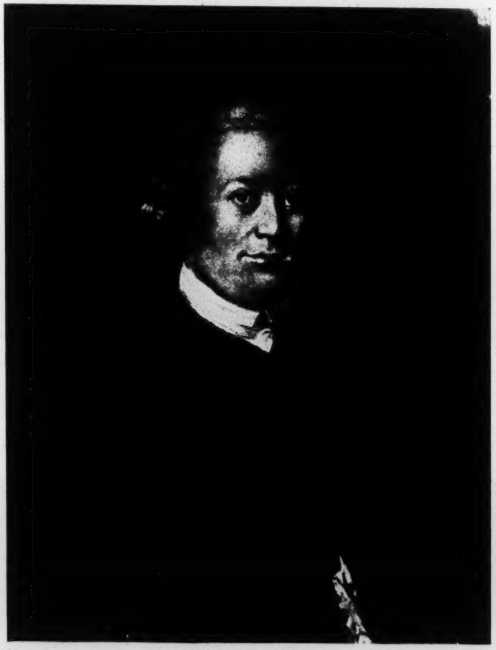
Theſe may certify that
[illegible] has diligently
attended an entire course of my
Anatomical Lectures & Demonſtrations; to-
gether with Phyſiological & Surgical obser-
vations at the diſsecting Theatre in the
American Hospital Boston: whereby
he has had an opportunity of acquiring
an accurate knowledge in the structure
of the human body. John Warren [illegible]

BOSTON
[illegible]
1782

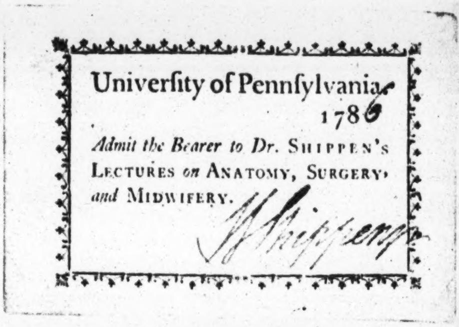
CERTIFICATE OF ATTENDANCE AT WARREN'S COURSE OF LECTURES, 1782, THE ORIGINAL OF WHICH WAS ENGRAVED BY PAUL REVERE.

In New York, the popular prejudice against dissection culminated in the celebrated Doctors' Mob of April, 1788. Doctor Richard Bayley, having waved the arm of a cadaver at a boy who was peeping through the window of the Society of the Hospital in the City of New York,[38] a mob collected which stormed the buildings, burned Bayley's valuable pathological collection, and attacked the jail whither the Doctors had fled. Seven rioters were killed and several more wounded before the disturbance was quelled by the militia. Probably from this riot, however, came the first law to aid Anatomy, when New York, in 1789 made it lawful for the courts to add dissection to the death penalty in cases of murder, arson and burglary. In 1788 also, Wiesenthal's School in Baltimore was invaded by a mob, and the body of the murderer, Cassidy, which was being dissected, was taken from the gentlemen who were then studying anatomy and surgery.[39]

In 1778, the state of Virginia had stopped the dissection of executed criminals, permission for which had previously been a prerogative of the Royal Governors, and the Massachusetts Act of 1784 was apparently designed to discourage duelling rather than to protect anatomy. In it, the coroner was directed that he shall either bury the bodies of dead duellists "without a coffin, with a stake drove through the body ...... or shall deliver the body to any surgeon or surgeons to be dissected and anatomized." In 1790 the first Congress of the United States passed a law similar to the New York law of 1789; but it was not until 1831 that any further advance was made, when Massachusetts authorized the delivery to the Anatomists of the unclaimed bodies of "deceased persons required to be buried at the public expense."[40] Even as late as this, however, coincident with the English "Resurrectionists," it is told that Dr. Beck had to drive a corpse from Albany to Boston, on account of the scarcity of anatomical material. In the State of Pennsylvania it was not until 1883 that a satisfactory law was obtained for the legal acquisition by an Anatomical Board of unclaimed and other bodies, for purposes of dissection and anatomical study. Since that time, however, there has never been any serious dearth of anatomical material, and with the gradual enlightenment of public opinion, the student has long been able to dissect to his heart's content without fear of mob violence. With an abundance of material and equipment, conditions for anatomical study in this country are therefore favorable. Although the steps of medical progress have inevitably, for the most part, left the firm footing of normal and pathological anatomy for more complicated and shifting fields, let us hope that the proper importance of these studies to the student beginning medicine will never be wholly lost sight of.



PORTRAIT OF WILLIAM HUNTER OF NEWPORT, R. I., PAINTED BY COSMO ALEXANDER, NOW IN THE POSSESSION OF A. F. HUNTER OF NEWPORT.



Univerſity of Pennſylvania
1786
Admit the Bearer to Dr. SHIPPEN'S
LECTURES *on* ANATOMY, SURGERY,
and MIDWIFERY.
W Shippen

CERTIFICATE OF ATTENDANCE AT SHIPPEN'S LECTURES.

BIBLIOGRAPHY

1. THOMAS WOOTTON, "Surgeon General of the London Company," and the "Chirurgeon Gentleman" of Capt. John Smith, accompanied

the expedition that sailed from England on December 19, 1606, to found Jamestown (Toner's Medical Education in the United States, and Stith's History of Virginia, p. 48).

2. **Samuel Fuller**, medical practitioner and divine, who died at Plymouth in 1633, of a contagious disease caught from one of his patients (Toner, *loc. cit.*, p. 12).

3. **Sebastian Crol** and **Jan Huyck** came with Peter Minuit in 1626 (Walsh, J. J.: History of Medicine in New York).

4. **Thomas Lloyd**, **Griffith Owen** and **Thomas Wynne**.

5. On February 11, 1677, **Thomas Thacher**, a clergyman and physician, published "A Brief Rule to guide the Common People of New England how to order themselves and theirs in the Small Pocks or Measels." A transcript of this occurs in Toner's epitome.

6. The Clear Sun-shine of the Gospel breaking forth upon the Indians of New England, etc., by Thos. Shepard, reprinted in the *Coll. of the Mass. Hist. Soc.*, 1834, 3d s., iv, 37.

7. General Court (of Massachusetts) Records ii, 175, Session beginning October 27, 1647.

8. **Hartwell**, E. M. Hindrances to Anatomical Studies in the United States. *Annals of Anat. and Surg.*, 1881, iii, 209.

9. Quoted by Hartwell, *loc. cit.*, from the *Pub. of the Mass. Hist. Soc.*

10. **Packard**, F. R. The History of Medicine in the United States, p. 63.

11. In a MS. Order of Council of Lord Baltimore dated St. Marys in Maryland, July 20, 1670, John Stansley and John Pearce, Chyrurgeons, are ordered to view on Monday, August 8, 1670, the head of one Benjamin Price, supposed to have been killed by the Indians.

12. **Dr. Johannes Kerfbyle** was a graduate of the University of Leyden, who came to New York about the time of the Dutch surrender. For the examination of the body of Gov. Slaughter, the six surgeons received £ 8,800, by order of the Council (Valentine's Manual of Common Council of New York, 1864, p. 590, quoted by Toner).

13. **Walsh**, J. J. The History of Medicine in New York, i, 37.

14. See **Dulles**, C. W. Life of Thomas Cadwalader. *Pa. Mag. of Hist. and Biog.*, 1903, p. 262, and Kelly and Burrage, American Medical Biographies, p. 189.

15. **Wistar**, C. Eulogium on Dr. William Shippen, College of Physicians of Philadelphia, March, 1809.

16. The date 1750, that is sometimes given, is according to Dulles admittedly wrong, and in view of the preceding quotations, is much less probable than the earlier date.

17. An Essay on the West India Dry Gripes, to which is added an extraordinary case in physics. Printed by Benjamin Franklin, 1745.

18. Settlements in North America, quoted by Wickes, History of Medicine and Medical Men in New Jersey, Newark, 1871, p. 16.

19. Annual address to the Medical Society of the State of New York, 1811, quoted by N. S. Davis, History of Medical Education and Institutions in the United States, Chicago, 1851.

20. By photostat, from the copy in the New York Public Library.

21. **Kelly** and **Burrage**, *loc. cit.*, **Norris**, G. W. Early History of Medicine in Philadelphia, p. 209.

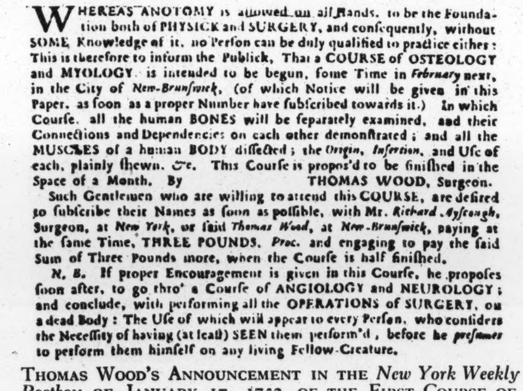
22. **Garrison**, F. H. History of Medicine, p. 336.

23. These beautiful anatomical charts were made in 1755 by J. Van Riemsdyck, the artist employed by William Hunter to illustrate his work on the gravid uterus, from preparations made by Jenty, a well-known London dissector. As the crayons were made seven years before their presentation to the Pennsylvania Hospital, it is probable that they were a chance find, rather than done specifically for this purpose. Of the eighteen crayons, seventeen, recently reframed, now stand in the library of the Pennsylvania Hospital. The first of the series signed Burgess, though by a different hand, obviously belonged to the original lot. The eighteenth of the present set, an oil painting of the Love Sickness, has probably been included with the lapse of time to replace one that was lost. A recent cleaning, which revealed a figure of Cupid with bow and arrow in the background, furnishes its title. The crayons fall into three distinct groups; as two of these contain six and the other five, it is presumable that it is one of the stages of dissection of the whole body that has been lost. The three gypsum models of pregnancy now stand in the museum of the Ayer Laboratory at the Hospital.

24. **Morton**, T. G. History of the Pennsylvania Hospital, 1751–1895; Packard, F. R., *loc. cit.*, and Scott, J. A., concerning the Fothergill pictures at the Pennsylvania Hospital, *U. of Penna. Med. Bull.*, 1904, xvi, 358. Another evidence of Fothergill's far-sighted generosity was his presentation to the hospital in the same year of An Experimental History of the Materia Medica, by William Lewis, F.R.S., 1761, "for the benefit of the young

students in physic, who may attend under the direction of the physicians." This proved to be the first book of the first institutional medical library in the country, which library had grown by 1790 to 528 volumes, and by 1857 to 10,500, and was probably during that period the best in the country.

25. The subject of his thesis, De Placentae cum utero nexo, 1761, indicates already the bent of his activity.
26. Henry, F. P. Standard History of Medicine in Philadelphia, p. 44.
27. Morton, T. G. The History of the Pennsylvania Hospital, 1751–1895, p. 36.
28. Packard, F. R., *loc. cit.*, and Morton, T. G., *loc. cit.*
29. In 1790, with a total population in the UniteP States of 3,928,326, Philadelphia had 45,250; New York, 33,131; Boston, 18,038; Charleston, 16,359; and Baltimore, 13,503. (Compiled by Toner from first U. S. census.)
30. Mumford, J. G. Medicine 100 years ago, in
Surgical Memoirs and other Essays, p. 245.
31. Walsh, *loc. cit.*
32. Cordell, E. F. Charles Frederick Wiesenthal, Medicinae Practicus, the Father of the Medical Profession of Baltimore. *J. Hop. Hosp. Bull.*, 1900, xi–xii, 170.
33. Bartlett, Josiah. An Historical Sketch of the Progress of Medical Science. *Proc. Mass. Hist. Soc.*, 2s., i, 105.
34. Harrington, T. F., and Mumford, J. G. History of the Harvard Medical School, New York, *Lewis Hist. Pub. Co.*, 1905.
35. Warren, Edward. The Life of John Warren, M.D., Boston, 1874.
36. *loc. cit.* p. 228.
37. Norris, G. W. Early History of Medicine in Philadelphia.
38. This hospital was incorporated in 1771, and was also liberally helped by the afore-mentioned Dr. John Fothergill. Bayley, who like Shippen and others mentioned in this narrative, had also studied with William Hunter in London, later became Professor of Anatomy at Columbia.
39. Griffith's. Annals of Baltimore, quoted by Hartwell and Cordell.
40. Hartwell, *loc. cit.*



WHEREAS ANOTOMY is allowed on all Hands, to be the Foundation both of PHYSICK and SURGERY, and conſequently, without SOME Knowledge of it, no Perſon can be duly qualified to practice either: This is therefore to inform the Publick, That a COURSE of OSTEOLOGY and MYOLOGY is intended to be begun, ſome Time in *February* next, in the City of *New-Brunſwick*, (of which Notice will be given in this Paper, as ſoon as a proper Number have ſubſcribed towards it.) In which Courſe, all the human BONES will be ſeparately examined, and their Connections and Dependencies on each other demonſtrated; and all the MUSCLES of a human BODY diſſected; the *Origin*, *Inſertion*, and Uſe of each, plainly ſhewn, *&c.* This Courſe is propos'd to be finiſhed in the Space of a Month. By THOMAS WOOD, Surgeon.

Such Gentlemen who are willing to attend this COURSE, are deſired to ſubſcribe their Names as ſoon as poſſible, with Mr. *Richard Ayſcough*, Surgeon, at *New York*, or ſaid *Thomas Wood*, at *New-Brunſwick*, paying at the ſame Time, THREE POUNDS, *Proc.* and engaging to pay the ſaid Sum of Three Pounds more, when the Courſe is half finiſhed.

N. B. If proper Encouragement is given in this Courſe, he propoſes ſoon after, to go thro' a Courſe of ANGIOLOGY and NEUROLOGY; and conclude, with performing all the OPERATIONS of SURGERY, on a dead Body: The Uſe of which will appear to every Perſon, who conſiders the Neceſſity of having (at leaſt) SEEN them perform'd, before he *preſumes* to perform them himſelf on any living Fellow-Creature.

Thomas Wood's Announcement in the *New York Weekly Postboy* of January 17, 1752, of the First Course of Anatomical Lectures given in British America.

SOME EARLY OBSERVERS OF ALBUMINURIA

By WILLIAM DOCK, M. D.

PETER BENT BRIGHAM HOSPITAL

BOSTON, MASS.

IN 1694 a century before Wells (1811) and Blackall (1813) published their observations on dropsy and albuminuria, Frederick Dekkers described the effect of heat and acetic acid on certain types of urine, and in 1764, sixty-two years before Bright's classical work on nephritis, Domenico Cotugno described a typical case of acute nephritis, with anasarca, and large quantities of a heat-coagulable substance, "ovi albumini persimilem," in the urine. Cotugno's observation is remarkable in that he was testing for albumin, whose probable presence in cases of dropsy he had deduced from experiments on the body fluids from dropsical cadavers.

Dekkers (1648–1720) was a pupil of Sylvius and for thirty years Professor of Medicine in the University of Leyden. His claim to the discovery of albuminuria was first brought forward by Wilhelm Leube ("Ueber die Bedeutung der Chemie in der Medizin," Berlin, 1884). He contributed to Paul Barbette's "Praxis Barbettiana" and wrote a medical textbook, "Exercitationes Practicae Circa Medendi Methodum" which dealt with disease under eight headings as determined by the type of therapy. This was published in Leyden in 1694, and went through several editions in Latin, French and Dutch. The illustrations reproduced here are from the Dutch edition of 1717, printed by Johannes de Vivie in Leyden, a copy of which, from the collection of the late Dr. F. J. Lutz, was obtained from the library of the Washington University School of Medicine, St. Louis. In the fifth chapter of this book he discusses cathartics, and especially their effect upon dropsy. The discussion is chiefly in case-histories, among them that of "a woman forty years old, mother of five children, melancholy, hard-living but healthy," who developed dropsy, and after all else had failed was treated with permanent drains, inserted on a needle, as shown by his illustration. He mentions the fact that the urine of these patients frequently contains much sediment, especially after boiling and adds:

> I can scarcely pass by the fact that the waters of consumptives and emaciated people are clear and translucent, when unboiled. But I have also found that these when placed on the fire, soon become milky, really smelled like milk, and had the taste of sweet milk; when a drop or two of acetic acid were added to this, and it was then placed in the cool air, shortly a white rennet, namely, the caseous part, sank to the bottom, and the oily or buttery part floated up, and there was a sweet whey, quite homogeneous, free of the different parts now; wherefrom we might conclude that this urine is a kind of clear and very thin or watery chyle, or nourishing fluid.

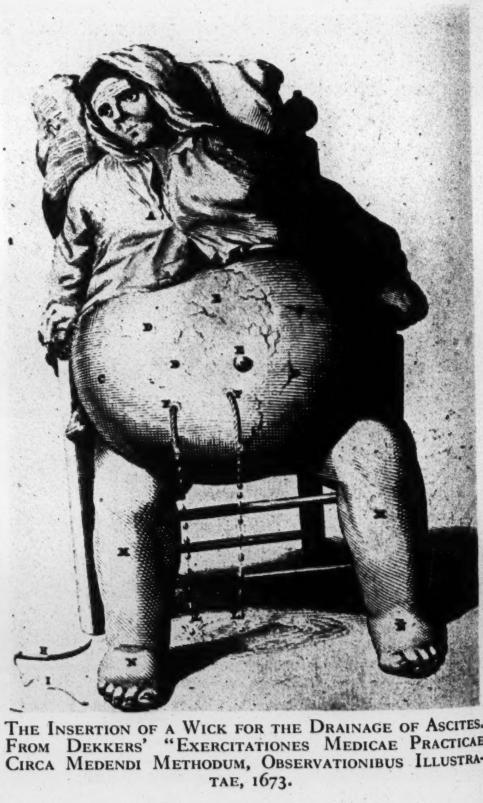
It is futile to speculate on the character of the "oily particles," though it seems likely that Dekkers' imagination was too much taken by the similarity between the appearance of the boiled urine and milk. It is evident that the acetic acid was added to confirm the notion that this fluid was milk, and the reaction so accorded with his ideas that he made no further study of it. In fact, it is not apparent from his description that many specimens were examined, nor does he link up this albuminuria with dropsy, but rather regarded it as a frequent occurrence in wasting diseases.

Cotugno, or Cotunnius, was born in 1736, became Professor of Anatomy at Naples in 1766 and died in 1822. He gave a very good description of the intestinal lesions of typhoid fever, the pustules of smallpox, and described the nasopalatine nerve, the cerebrospinal fluid and the internal ear. Since the World War Italian otologists have hailed him as the original propounder of the theory of sound-perception which is known by Helmholtz's, name. His celebrated contemporary, von Haller, describes him as "a brilliant man, keen and shrewd in the most detailed investigations."

Frederik Dekkers
(1648–1720)

His experiments on coagulability of various body fluids were part of a study of sciatica, which was published with the title "De Ischiade Nervosa Commentarius," and dedicated to his teacher, Gerhard van Swieten. This was first published in Naples in 1765, and went through at least five subsequent editions, in Vienna, Venice and Naples. The copy on which this account is based was printed in Venice in 1782, and was obtained from the collection of Dr. George Dock, to whom I am indebted for valuable suggestions in preparing this study.

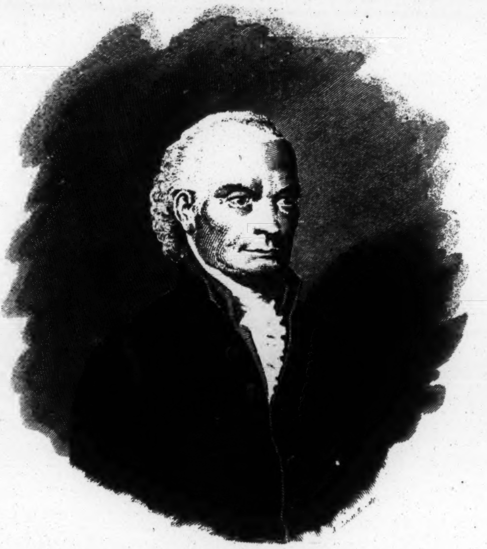
In this work he ascribes sciatica to a dropsy of the dural sheaths of the roots of the sciatic nerves and discusses at length the nature of the cerebrospinal fluid. Prior to his time it had been thought that the fluid in the subarchnoid was a post-mortem artefact, the space being filled during life with "vapor" or even being a mere vacuum. To prove that this was artefact his opponents had stated that the spinal fluid was not coagulable by heat, while that obtained from the ventricles of the brain was coagulable. Cotugno found that in most of his experiments, as in those of Bellinius, Brunnerus, Boerhaave and de Haen, the fluid of the ventricles, like that of the spinal cord, evaporated entirely, without forming any coagulum. He attributed his critics' results to their having obtained the ventricular fluids from hydrocephalics and gave the following discussion of inflammatory exudates:



The Insertion of a Wick for the Drainage of Ascites. From Dekkers' "Exercitationes Medicae Practicae Circa Medendi Methodum, Observationibus Illustratae, 1673.

> Thus I shall show that all the humors of the body which, when secreted naturally from the blood, are not coagulable, frequently become

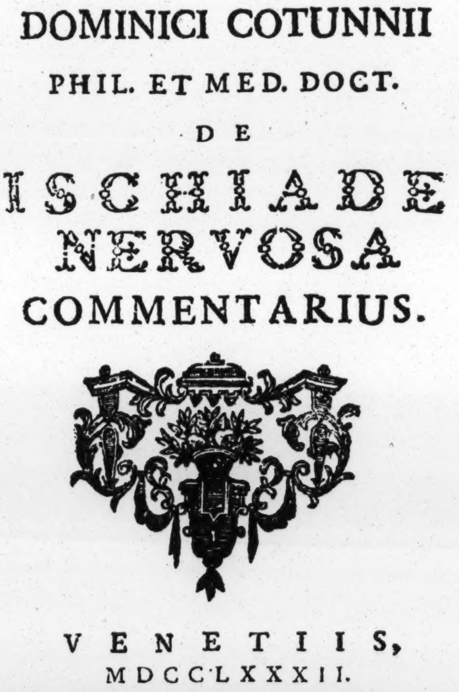
> coagulable from serious disturbances. I shall begin with urine, which everyone knows is not coagulable but which was seen to coagulate in those experiments of ours which I am about to describe.
>
> A soldier, twenty-eight years old, was stationed for many years at mild and very damp Baiae. About the end of August he was seized with an intermittent quotidian fever, which strangely broke out in dropsy in five days. At the beginning of September he was brought to my Sanatorium and intrusted to my care. He was suffering at this time with immense watery swellings of his whole body, and overwhelmed by the hitherto daily attacks of fever; the dropsy seemed to increase daily, shortly before the paroxysms. The excreta were dry, there was but little urine and he was wholly cast down in mind.



DOMENICO COTUGNO
(1736–1822)

Then followed the effects of treatment with ipecac, Peruvian bark and rhubarb, squill pills and sassafras decoctions:

> But the urine flowed much less and finally the dropsical swelling seemed to grow . . . In this case it seemed best to use cream of tartar, whose effect in provoking urine, without accelerating the pulse, I have shown in other experiments. By this remedy the output of urine was increased so that the sick man passed ten or twelve pints of concentrated urine in a night. However, since the sick man himself admitted that his drinking had been very slight, it was certain that the enormous quantities of urine were being drawn especially from waters collected in the dropsy. Although this was shown by the decrease in the distention of the body, it seemed best to settle this question by a definite experiment, heating the urine. For I had often conclusively shown that the fluid collected beneath the skin of such dropsical cadavers contained material capable of coagulation and I hoped that if the sick man passed such fluid by way of the urine, coagulation would be seen if the material which flowed out were heated; which, as I had anticipated, was proved by experiment. For with two pints of this urine exposed to the fire, when scarcely half evaporated, the remainder made a white mass, already loosely coagulated like egg albumen. . . Thus it was shown for the first time that urine, which no one had shown to be coagulable if from healthy people, can at some time contain a coagulable substance.



DOMINICI COTUNNII
PHIL. ET MED. DOCT.
DE
ISCHIADE
NERVOSA
COMMENTARIUS.

VENETIIS,
MDCCLXXXII.
Typis Bartholomaei Occhi
SUPERIORUM PERMISSU.

TITLE PAGE OF "DE ISCHIADE NERVÔSA COMMENTARIUS" BY DOMENICO COTUGNO.

He then discusses the fluids present in the serous cavities and states that when normally clear they are different from lymph in that they are not coagulable, as he had shown often in cadavers and five times in the pericardial fluid of living dogs, and as Malpighi had shown in the pericardial fluid of a live cow. Those fluids which did coagulate were entirely different in character, "of a new color, concentrated and yellow and far from a pure watery colorlessness." These he regarded as inflammatory, as in the cerebrospinal fluid of hydrocephalus, the pleural and pericardial effusions of dropsy. "The hydrocele of the sheath of the testis, the fluids of which are coagulable, is wont to be preceded by an inflammation of the testis." He gave a rather simple theory of these processes, based on the supposition that blood consisted of three parts, "one red, which is composed of innumerable minute discs; another yellow which is hardened at the fire; and finally, the pure aqueous." The red part was confined to the arteries and veins, the yellow passed into the lymphatics, while the aqueous also went through fine pores into the serous cavities, pulmonary and oral surfaces. That which came in contact with the air evaporated and could be seen condensing in cold weather, the part that entered the serous sacs remained as a pure, clear fluid, but when inflammation blocked the lymphatics the rapid pulse of fever forced the lymph into the intercellular spaces and serous cavities, where it might coagulate. "Nor have those pathologic ligaments, which we have often seen, after such inflammations binding either the pericardium to the heart, or the pleurae to the lungs, any other origin."

So perfect was Cotugno's theory that he missed the entire significance of albuminuria, as we understand it, and having discomfited the critics of his notions on cerebrospinal fluid, made no further observations on this phenomenon. Those who read his work, notably Erasmus Darwin, who quoted him in his "Zoonomia," approved his theory. Those accidentally discovering albumen in the urine of nephritis, were more impressed than Cotugno, who had predicted its presence, investigated further and established the importance of this condition. We may conclude by saying of Cotugno, as Blackall does of Dr. Darwin:

> This great author would, without doubt, have modified his opinion, had he made any experiments, and would have ascertained that the coagulation of which he speaks, takes place long before the boiling heat; that it is not a temporary relief, but a continued symptom of dropsies through their whole course; and that the curative effort of nature is urine not loaded with serum, but almost devoid of it.

MEDICAL MAGIC*

By ISADOR H. CORIAT, M. D.

BOSTON, MASS.

ANY inquiry into the evolution of medicine, must deliberate upon the important question—how far is the modern physician to be considered the social counterpart of the primitive "medicine-man," or to state it more broadly, from the psychological standpoint, what survivals of archaic thinking, either conscious or unconscious, can be detected in the practise of modern medicine? By modern medicine is understood the development of medicine as a science or art within the last fifty years, after it had freed itself, in part at least, from the encrusted superstitions of past centuries.

In order that the approach to the question may be clarified, it will be necessary to examine briefly the general development of the thinking processes in the human race and of scientific or medical thinking in particular. In the primitive "medicine-man" the thinking was undirected, it turned away from reality, set free subjective wishes, created nothing, was wholly unproductive. Because of the fantasy-like character of this thinking, magic was evolved, and magic is nothing else but the primitive medicine-man's belief in the omnipotence of his thoughts. In the modern physician, on the contrary, knowledge is based on the contributions of the various biological, physical and psychological sciences to the practice of medicine. In medicine as an art, the thinking is of the directed type, it faces reality, acts upon it and consequently, is constantly creating new innovations and new adaptations. In other words, directed thinking is productive. However, the chief theme of this contribution will attempt to demonstrate, that even in the directed thinking of the modern physician, there exist unconscious survivals of the undirected thoughts of the primitive medicine-man, a sort of belief in the magical omnipotence of his therapeutic wishes. Such an inquiry may be of great value for the understanding of certain aspects of modern medicine, for it is "out of such bed-rock stuff, that advanced medical science is in no small part developed."[1]

It is not my purpose to minimize the high cultural value of this magical belief in the power of thought, for this omnipotence of thought is a part of man's unconscious heritage from primitive society, it is almost instinctive, if instinct is regarded as the accumulated experience of the unconscious. As this omnipotence of thought existed in the childhood of the race, so it also exists in the childhood of civilized man and its repressed tendencies often crop out as symptoms of severe nervous and mental disorders. For instance it plays a striking part in the compulsion neuroses, while in the paranoiac states it often manifests itself in the form of imaginary systems, symbolic transformations or impossible inventions. On the contrary, all scientific research, all technical processes, directed towards the domination of the powers of nature or the minimizing of destructive processes in the human body through disease, spring from this omnipotence of thought. In these cases we are dealing with a transformation of imaginary wishes into real activities.

The subject of medical magic can be approached from several standpoints—such as the belief in the omnipotence of knowledge and of the actions of drugs without known physiological effect, that of undirected or autistic thinking in the treatment and prevention of disease and finally that

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* Read before the Boston Medical History Club, January 24, 1922.

[1] Marett, R. R. Psychology and Folk Lore, 1920.

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of the various types of medical thinking in therapeutics and scientific investigation. The subject is a very broad one and of great importance for the understanding of medical history, for only by understanding medical magic can one link up the concepts of primitive medicine with the astonishing developments of modern scientific medicine.

In view of its great importance, the work of Bleuler[2] must be considered in relation to the subject of medical magic. In the history of medicine, the subject of autistic thinking has played a prominent part, e.i.—the behavior of the physician in both diagnosis and therapeutics is often controlled by instincts, affective factors and wishes. Bleuler protests against this prevailing type of thinking and suggests thatmedical men must accustom themselves to a mode of thought which corresponds more closely to reality, it must be more realistic rather than a mixture of the realistic and the autistic, or in some cases, of the autistic alone. It is only when disciplined thought becomes a universal reality that the physician's function will finally develop into an intelligent aid to the patient's life and the regulation of the illness which has, to a greater or lesser extent, incapacitated him in the midst of his environment. According to Levy-Bruhl[3] the early conception of disease was a mystical one. Disease wasthought to be produced by an invisible or intangible agent.

Most of the material utilized in this subject of medical magic has been gathered from various portions of Frazer's "Golden Bough" principally in the first two volumes on "Magic Art and the Evolution of Kings" and in the third volume on "Taboo and the Perils of the Soul." The title of the twelve volumes "The Golden Bough," around which Frazer has grouped and evolved the important elements of man's mental development, is taken from the golden bough, or mistletoe which grew on the sacred oak in the ancient Arician grove of Diana in the valley of Nemi. It denoted the the divine life of the tree or symbolically the sacred fire or life principle, the plucking of which led to, and decided the death of the divine priest who presided over the sacred grove.

As this paper deals with the subject of medical magic almost exclusively as it is presented in Frazer's monumental work, it will be necessary to mention only briefly the various symbolic and mythological ramifications which make the reading of the "Golden Bough" such a delightful, intellectual treat. Such questions for instance as—why had Diana's priest at Nemi, the King of the Wood, to slay his predecessor, but before doing so, why had he to pluck the branch of a certain tree which the ancients identified with Virgil's Golden Bough? Even if these questions are not considered in detail, their relation to the subject of magic in general and of medical magic in particular, are necessary for a clear understanding of the material.

The whole of the "Golden Bough," which is really a study of magic and religion from the evolutionary standpoint, is concerned with man's struggles in his attempts at adaptation to reality. These twelve volumes are monumental in their material and while at times there may be some disagreement with the author's interpretations, yet the material collected and collated from the most varied sources, is of the highest value. The entire work contains a profound and detailed investigation of the customs, beliefs and thoughts of primitive people in their efforts to prolong life and to avoid death and disease.

Primitive man as a result of his limited experience knew principally contact and similarity and by these principles he sought to control the mysterious powers of nature, relating to his profoundest needs, such as sex, food, vegetation, death and disease. Certain men of the tribe, more clever and perhaps more unscrupulous than the rest, sought to exercise power over their fellowmen and thus acquire social and political supremacy. It was these men who became the leaders of the tribe. At first they were the magicians, later they evolved into the medicine-men claiming control over the mysterious life-principle of man, the cure of disease and the avoidance of death, or at least the postponement of death, to an indefinite period.

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[2] Bleuler, E. Das Autistisch—Undisziplinierte Denken in der Medizin und Seine Überwindung, 1919.

[3] Levy-Bruhl, L. Les Fonctions Mentales dans les Sociétés Inferieures, Chap. vii—La Maladie. Paris, 1918.

In the animistic stage of human culture, man ascribed omnipotence to himself, this is magic; in the religious stage, it was ceded to the gods, this is prayer; in the scientific stage, man ceased to believe in his own omnipotence or that of anthropomorphic external agencies, but ascribed it to the blind forces of the universe, this is energy.

Magic is an art and not a science. The idea of a source of magic is lacking in the undeveloped and primitive mind. Magic is essentially based on charms, either according to the law of similarity which is called homeopathic magic, or the law of contact or contagion, which is termed contagious magic. The primitive magician or medicine-man had a knowledge of magic only from what he felt were its practical results, and unlike what occurs in modern medical science, he never analyzed the mental processes on which the practice was based, such as for instance in Koch's laws or in the theories of anti-toxins or chemotherapy. Consequently, he remained in complete ignorance of the pathological processes of the disease, and the physiological or psychological readjustments, by which disease is ameliorated or cured. Frazer tabulates the branches of magic as follows:

SYMPATHETIC MAGIC
(Law of Sympathy)

Homeopathic Magic
(Law of similarity)

Contagious Magic
(Law of contact)

In modern medicine, the administration of certain ductless glands, which are devoid of physiological action when removed from the body and submitted to dessication and chemical processes, resembles the homeopathic medical magic of primitive man. I refer to the use of such animal substances in medicine as the spinal cord or brain for organic diseases at the nervous system or epilepsy and finally the use of prostate gland substance for enlarged prostate.

Often too, the individual ownership of magic formulae for the cure of disease, was held by an elderly woman as a trade secret, thus strongly resembling the patent medicines of a more complex society. In addition, it is cleverly stated, that to divulge the formula is to destroy its efficacy.

It has often been asserted that magical therapeutic formulae were utilized for the expulsion of those demons which were supposed to produce disease. This charm magic, or the treatment of disease through written or spoken medical charms, is only one subject of the problem, although these charms on ultimate analysis, will be found to present certain features of homeopathic or contagious magic. This because primitive man knew principally contact and similarity and by these principles alone sought to control the mysterious powers of nature and exercise control over the physical or mental well-being of his fellow-men.

Magic is a precursor of religion. The idea of a remote deity in very primitive societies had little effect on practical life and therefore man's gods, on which his life, happiness and health depended, devolved on his chiefs, magicians or medicine-men, which thus became the human interpreters of divine functions. Those leaders therefore, who claimed to control the mysterious life-principles of man, became not only the leaders of the tribe, but likewise the divine healers or medicine-men.

Without entering into further details of the evolution of magic and its essential principles, we will discuss at once the subject of this paper: medical magic, both homeopathic and contagious, in its attempts to cure disease and also the taboos of certain individuals who are afflicted with certain diseases or with certain profound changes concerning the menstrual cycle and the birth of children.

TREATMENT OF JAUNDICE[4]

The ancient Hindoos performed an elaborate ceremony, based on homeopathic magic, for the cure of jaundice. Its main drift was to banish the yellow color to yellow creatures and yellow things, such as the sun, to which it properly belongs, and to procure for the patient a healthy red color from a living vigorous source, namely a red bull. With this intention, a priest recited the following spell: "Up to the sun shall go to thy heart-ache and thy jaundice" (p. 79).

In Germany yellow turnips, gold coins, gold rings, saffron, and other yellow things are still esteemed remedies for the jaundice, just as a stick of red sealing wax carried on the person cures the red eruption popularly known as St. Anthony's fire, or the blood stone, with its blood-red spots allays bleeding. Another popular remedy in Germany for the red St. Anthony's fire and also for bleeding is supplied by the common crossbills (p. 81).

TREATMENT OF ALOPECIA

An ancient Indian cure for a scanty crop of hair was to pour a solution of certain plants over the head of the patient: this had to be done by a doctor who was dressed in black and who had eaten black food, and the ceremony must be performed in the early morning, while the stars were fading in the sky, and before the black crows had risen cawing from their nests. The exact virtue of these plants has escaped our knowledge, but we can hardly doubt that they were dark and hairy: while the black clothes of the doctor, his black food, and the swarthy hue of the crows unquestionably combined to produce a crop of black hair on the patient's head. A more disagreeable means of obtaining the same end is adopted by some of the tribes of Central Australia. To promote the growth of a boy's hair, a man with flowing locks bites the youth's scalp as hard as he can, being urged thereto by his friends, who sit around watching him at his task, while the sufferer howls aloud with pain. Clearly on the principle of capillary attraction, if I may say so, he thus imparts of his own mature abundance to the scarcity of his youthful friend (p. 83).

THE TREATMENT OF VOMITING, TUMORS AND PIMPLES

One of the great merits of homeopathic magic is that it enables the cure to be performed on the person of the doctor instead of on that of the victim, who is thus relieved of all trouble and inconvenience, while he sees his medical man writhe in anguish before him. For example, the peasant of Perche, in France, labor under the impression that a prolonged fit of vomiting is brought about by the patient's stomach becoming unhooked, as they call it, and so falling down. Accordingly, a practitioner is called in to restore the organ to its proper place. After hearing the symptoms he at once throws himself into the most horrible contortions, for the purpose of unhooking his own stomach. Having succeeded in the effort, he next hooks it up again in another series of contortions and grimaces, while the patient experiences a corresponding relief. Fee, five franks. In like manner a Dyak medicine-man, who has been fetched in a case of illness will lie down and pretend to be dead. He is accordingly treated like a corpse, is bound up in mats, taken out of the house, and deposited on the ground. After about an hour the other medicine-men loose the pretended dead man and bring him to life: and as he recovers the sick person is supposed to recover too. A cure for a tumor, based on the principle of homeopathic magic is prescribed by Marcellus of Bordeaux, court physician to Theodosius, the First, in his curious work on medicine. It is as follows: Take a root of vervain, cut it across, and hang one end of it around the patient's neck, and the other in the smoke of the fire. As the vervain dries up in the smoke, so the tumor will dry up and disappear. If the patient should afterward prove ungrateful to the good physician, the man of skill can avenge himself very easily by throwing the vervain into water, for as the root absorbs the moisture once more, the tumor will return. The same sapient writer recommends you, if you are troubled with pimples, to watch for a falling star, and then instantly while the star is still shooting from the sky to wipe the pimples with a cloth or anything that comes to hand. Just as the star falls from the sky so the pimples will fall from your body: only you must be careful not to wipe them with your bare hand, or the pimples will be transferred to it (p. 84).

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[4] The references to this and other subsequent quotations, until otherwise indicated, are from Vols. I & II of the "Golden Bough," entitled "The Magic Art and the Evolution of Kings."

THE USE AND EFFECT OF THE PLACENTA AND UMBILICAL CORD

Other parts which are commonly believed to remain in a sympathetic union with the body, after the physical connection has been severed, are the navel-string and the after-birth, including the placenta. So intimate, indeed, is the union conceived to be that the fortunes of the individual for good or evil throughout life are often supposed to be bound up with one or the other of these portions of his person, so that if his navel-string or after-birth is preserved and properly treated, he will be prosperous; whereas if it be injured or lost, he will suffer accordingly. Thus among the Maoris, when the navel-string dropped off, the child was carried to a priest to be solemnly named by him. But before the ceremony of naming began, the navel-string was buried in a sacred place and a young sapling planted over it. Ever afterward that tree as it grew, was a *tobu oranga* or sign of life for the child (p. 182).

The Incas of Peru preserved the navel-string with the greatest care, and gave it to the child to suck whenever it fell ill. In ancient Mexico they used to give the boy's navel-string to soldiers, to be buried by them on a field of battle in order that the boy might thus acquire a passion for war. But the navel-string of a girl was buried beside the domestic hearth, because this was believed to inspire her with a love of home and a taste for cooking and baking. Algonquin women hung the string around the child's neck, if he lost it they thought the child would be stupid and spiritless. Among the Thompson Indians of British Columbia the navel-string was sewed up by the mother in a piece of buckskin embroidered with hair, quills or beads. It was then tied to the broad buckskin band which extended round the head of the cradle on the outside. Many thongs hung from it, each carrying fawn's hoofs and beads that jingled when the cradle was moved. If the navel-string were lost, they looked on it as a calamity, for they believed that in after years the child would become foolish or would be lost in the chase or on a journey. Among the Kwakiut Indians of British Columbia the after-birth of girls is buried at high-water mark, in the belief that this will render them expert at digging for clams. The after-birth of boys is sometimes exposed at places where ravens will eat it, because the boys will thus acquire the raven's prophetic vision. The same Indians are persuaded that the navel-string may be the means of imparting a variety of accomplishments to its original owner. Thus, if it is fastened to a dancing mask, which is then worn by a skilful dancer, the child will dance well. If it is attached to a knife, which is thereafter used by a cunning carver, the child will carve well. Again if the parents wish their son to sing beautifully, they tie his navel-string to the baton of the singing master. Then the boy calls on the singing master every morning while the artist is eating his breakfast. The votary of the Muses thereupon takes his baton and moves it twice down the right side and twice down the left side of the boy's body, after which he gives the lad some of his food to eat. That is an infallible way of making the boy a good singer. Among the Cherokees, the navel-string of an infant girl is buried under the corn-mortar, in order that the girl may grow up a good baker: but the navel-string of the boy is hung on a tree in the woods, in order that the boy may be a hunter. Among the Kiawas the navel-string of a girl is sewn up in a small beaded pouch and worn by her at her belt as she grows to womanhood. If the girl's mother ever sells the belt and pouch she is careful to extract the navel-string from the pouch before the bargain is struck. Should the child die, the pouch containing her navel-string would be fastened to a stick and set up over her grave (pp. 196–198).

Thus, in many parts of the world the navel-string, or as more commonly called the after-birth, is regarded as a living being, the brother or sister of the infant, or as the material object in which the guardian spirit of the child or part of its soul resides. This latter belief we have found among the aborigines of Queensland, the Battas of Sumatra, and the Norsemen of Iceland. In accordance with such beliefs it has been customary to preserve these parts of the body, at least for a time, with the utmost care, lest the character, the fate, or even the life of the person to whom they belong should be endangered by their injury or loss. Further, the sympathetic connection supposed to exist between a person and his after-birth or navel-string comes out very closely in the widespread custom of treating the after-birth or navel-string in ways which are supposed to influence for life the character and career of the person, making him if it is a man, a swift runner, a nimble climber, a strong swimmer, a skilful hunter, or a brave soldier, and making her, if it is a woman, an expert fisher, a cunning sempstress, a good cook or a baker, and so forth. Thus the beliefs and usages concerned with the after-birth or placenta, and to a less extent with the navel-string present a remarkable parallel to the widespread doctrine of the transferable or external soul and the customs founded on it. Hence it is hardly rash to conjecture that the resemblance is no mere chance coincidence, but that in the after-birth or placenta we have a physical basis (not necessarily the only one) for the theory and practice of the external soul (p. 200).

TREATMENT OF WOUNDS

A curious application of the doctrine of contagious magic is the relation commonly believed to exist between a wounded man and the agent of the wound, so that whatever is subsequently done by or to the agent must correspondingly affect the patient either for good or evil. Thus Pliny tells us that if you have wounded a man and are sorry for him, you have only to spit on the hand that gave the wound, and the pain of the sufferer will be instantly alleviated. In Melanesia, if a man's friends get possession of the arrow which wounded him, they keep it in a damp place or in cool leaves, for this will clearly inflame and irritate the wound. Further, they keep the bow near the fire to make the wound which it has inflicted hot: and for the same reason they put the arrow head, if it has been recovered, into the fire. Moreover they are careful to keep the bow-string taut and to twang it occasionally, for this will cause the wounded man to suffer from tension of the nerves and spasms of tetanus (p. 201).

TREATMENT OF DROPSY

Another beneficent use of homoeopathic magic is to heal and to prevent sickness. In ancient Greece, when a man died of dropsy, his children were made to sit with their feet in hot water until the body was burned. This was supposed to prevent the disease from attacking them. Similarly, on the principle of water to water, among the natives of the hills near Rajamahall in India, the body of a person who has died of dropsy is thrown into a river: they think that if the corpse were buried, the disorder would return and carry off other people (p. 78).

EXPULSION OF THE DEMONS OF DISEASE[5]

When Crevaux was travelling in South America he entered a village of the Apalai Indians. A few moments after his arrival some of the Indians brought him a number of large, black ants, of a species whose bite is painful, fastened on palm leaves. Then all the people of the village without distinction of age or sex, presented themselves to him, and he had to sting them all with the ants on their faces, thighs, and other parts of their bodies. Sometimes when he applied the ants too tenderly they called out, "More! More!" and were not satisfied until their skin was thickly studded with tiny swellings like what might have been produced by whipping them with nettles. The object of this ceremony is made plain by the custom observed in Amboyna and Uliase of sprinkling sick people with pungent spices, such as ginger and cloves, chewed fine in order by the prickling sensation to drive away the demon of disease which may be clinging to their persons. In Java a popular cure for gout or rheumatism is to rub Spanish pepper into the nails of the fingers and toes of the sufferer: the pungency of the pepper is supposed to be too much for the gout and rheumatism, who accordingly depart in haste. So, on the Slave Coast of Africa, the mother of a sick child sometimes believes that an evil spirit has taken possession of the child's body, and in order to drive him out, she makes small cuts in the body of the little sufferer and inserts green peppers or spice in the wounds, believing that she will thereby hurt the evil spirit and force him to be gone. The poor child naturally screams with pain, but the mother hardens her heart in the belief that the demon is suffering equally. In Hawaii, a patient is sometimes pricked with bamboo needles for the sake of hurting and expelling a refractory demon who is lurking in the sufferer's body and making him ill. Dyak sorceresses in south eastern Borneo will some-

[5] All subsequent references are in Vol. III—"Taboo and the Peril of the Soul."

times slash the body of a sick man with sharp knives in order, it is said, to allow the demon of disease to escape through the cuts, but perhaps the notion rather is to make the present quarters of the spirit too hot for him. With a similar intention some of the natives of Borneo and Celebes sprinkle rice upon the head or body of a person supposed to be infested by dangerous spirits: a fowl is then brought which, by picking up the rice from the person's head or body, removes along with it, the spirit or ghost which is clinging like a burr to his skin. This is done, for example, to persons who have attended a funeral, and who may therefore be supposed to be infested by the ghost of the deceased. Similarly Basutos, who have carried a corpse to the grave, have their hands scratched with a knife from the tip of the thumb to the tip of the forefinger, and magic stuff is rubbed into the wound, for the purpose, no doubt, of removing the ghost which may be adhering to the skin. Among the Barotse of south-eastern Africa, a few days after a funeral a sorcerer makes an incision in the forehead of each surviving member of the family and fills it with medicine, "in order to ward off contagion and the effect of the sorcery which caused the death." When elephant hunters in East Africa have killed an elephant they get upon its carcass, make little cuts in their toes, and rub gunpowder into the cuts. This is done with the double intention of counteracting any evil influence that may emanate from the dead elephant, and of acquiring thereby fleetness of foot possessed by the animal in its life. The people of Nias carefully scrub and scour their weapons and clothes which they buy, in order to efface all connection between the things and the persons from whom they bought them (pp. 105–107).

TABOOS OF MENSTRUATION

In general we may say that the prohibition to use the vessels, garments, and so on of certain persons, and the effects supposed to follow an infraction of the rule, are exactly the same whether the persons to whom the things belong are sacred or what we might call unclean or polluted. As the garments which have been touched by a sacred chief, kill all those who handle them, so do the things which have been touched by a menstrous woman. An Australian blackfellow, who discovered that his wife had lain on his blanket at her menstrual period, killed her and died of terror himself within a fortnight. Hence Australian women at these times are forbidden under pain of death to touch anything that men use, or even to walk on a path that any man frequents. They are also secluded at childbirth, and all vessels used by them during their seclusion are burned. In Uganda the pots which a woman touches while the impurity of childbirth or menstruation is on her should be destroyed: spears and shields defiled by her touch are not destroyed but only purified. No Esquimaux of Alaska will willingly drink out of the same cup or eat out of the same dish that has been used by a woman at her confinement until it has been purified by certain incantations. Amongst some of the Indians of North America, women, at menstruation are forbidden to touch man's utensils, which would be so defiled by their touch that their subsequent use would be attended by certain mischief or misfortune. For instance, in some of the Tinneh or Dene tribes, girls verging on maturity take care that the dishes out of which they eat are used by no one else. When their first periodical sickness comes on, they are fed by their mothers or nearest kinswoman, and will on no account touch their food with their own hands. At the same time they abstain from touching their heads with their hands and keep a small stick to scratch their heads with when they itch. They remain outside the house in a hut built for the purpose, and wear a skull-cap made of skin to fit very tight, which they never lay aside till the first monthly infirmity is over.

A fringe of shells, bones, and so on hangs down from their foreheads so as to cover their eyes, lest any malicious sorcerer should harm them during this critical period. Among all the Dene and most of other American tribes, hardly any other being was the object of so much dread as a menstruating woman. As soon as signs of that condition made themselves apparent in a young girl she was carefully segregated from all but female company, and had to live by herself in a small hut away from the gaze of the villagers or of the male members of the roving band. While in that awful state, she had to abstain from touching anything belonging to man, or the spoils of any venison or other animal, lest she would thereby pollute the same, and condemn the hunters to failure, owing to the anger of the game thus slighted. Dried fish formed her diet, and cold water absorbed through a drinking tube, was her only beverage. Moreover, as the very sight of her was dangerous to society a special skin bonnet, with fringes falling over her face down to her breast, hid her from the public gaze, even some time after she had recovered her normal state. Among the Bribri Indians of Costa Rica a menstrous woman is regarded as unclean (bukuru). The only plates she may use for her food are banana leaves, which when she has done with them she throws away in some sequestered spot for were a cow to find them and eat them, the animal would waste away and perish. And she drinks out of a special vessel for a like reason: because if anyone drank out of the same cup after her, he would surely die. In the Islands of Mabuiag and Saibai, in Torres Straits, girls at their first menstruation are strictly secluded from the sight of man. In Mabuiag the seclusion lasts three months, in Saibai about a fortnight. During the time of her separation the girl is forbidden to feed herself or to handle food, which is put into her mouth by women and girls told off to wait on her (pp. 145–147).

TABOOS OF CHILDBIRTH

These customs show that in the opinion of some primitive peoples a woman, at and after childbirth, is pervaded by a certain dangerous influence which can infect anything and anybody she touches: so that in the interests of the community it becomes necessary to seclude her from society for awhile until the virulence of the infection has passed away, when, after submitting to certain rites of purification, she is again free to mingle with her fellows. This dread of lying-in women appears to be widespread for the practice of shutting them up at such times in lonely huts away from the rest of the people is very common. Sometimes the nature of the danger which is apprehended from them is explicitly stated. Thus in the island of Tumleo, off German New Guinea, after the birth of her first child a woman is shut up with her first infant for five to eight days, during which no man, not even her husband, may see her, for the men think that were they to see her, their bodies would swell up and they would surely die. Apparently their notion is that the sight of a woman who has just been big with child, will, on the principles of homoeopathic magic, make their bodies big also to bursting. The Sulka of New Britain imagine that when a woman has been delivered of a child, the men become cowardly, weapons lose their force, and the slips which are being planted out are deprived of their power of germinating. Hence they perform a ceremony which is intended to counteract this mysterious influence on men and plants (pp. 150–151).

TABOOS OF ABORTION AND MISCARRIAGE

But the secretions of childbed is particularly terrible when it is the product of a miscarriage, especially a concealed miscarriage. In this case it is not merely the man who is threatened or killed, it is the whole country, it is the sky itself which suffers. By a curious association of ideas a physiological fact causes cosmic troubles! Thus, for example the Ba-Pedi believe that a woman who has procured abortion can kill a man merely by lying with him: her victim is poisoned, shrivels up, and dies within a week. As for the disastrous effect which a miscarriage may have on the whole country, I will quote the words of a medicine-man and rain-maker of the Ba-Pedi tribe: "When a woman has had a miscarriage, when she has allowed her blood to flow, and has hidden the child it is enough to cause the burning winds to blow and to parch the country with heat. The rain no longer falls, for the country is no longer in order. When the rain approaches the place where the blood is, it will not dare to approach. It will fear and remain at a distance. That woman has committed a great fault. She has spoiled the country of the chief, for she has hidden blood which has not yet been well congealed to fashion a man. The blood is taboo (yila). It should never drip on the road! The chief will assemble his men and say to them, 'Are you in order in your villages?' Someone will answer, 'Such and such a woman was pregnant and we have not yet seen the child which she has given birth to!' Then they go and arrest the woman. They say to her 'Shew us where you have hidden it.' They go and dig at the spot, they sprinkle the hole with a decoction of mbendoula and nyangale (two sorts of roots) prepared in a special pot. Then they take a little of the earth of this grave, they throw it into the river; then they bring back water from the river and sprinkle it where she shed her blood. She herself must wash every day with the medicine.

Then the country will be moistened again (by rain). Further, we (medicine-men) summon the women of the country: we tell them to prepare a ball of the earth which contains the blood. They bring it to us one morning. If we wish to prepare medicine with which to sprinkle the whole country, we crumble this earth to powder: at the end of five days we send little boys and little girls, girls that yet know nothing of women's affairs and have not yet had relations with men. We put the medicine in the horns of oxen, and these children go to all the fords, to all the entrances of the country. A little girl turns up the soil with her mattock, the others dip a branch in the horn and sprinkle the inside of the hole saying, 'Rain! Rain!' So we remove the misfortune the women have brought on the roads: the rain will be able to come. The country is purified!" (pp. 153–154).

These medical taboos are extremely interesting, for they correspond to the mechanism of taboos in general. That is, whoever does what is prohibited and violates the taboo, becomes himself taboo, probably as a defense of the social group in which he lives, because, according to the laws of contagious magic, he thus acquires the dangerous property of either infecting others or of inciting others to imitation. Hence the social ceremonials erected around the tabooed individual. This taboo prohibition of primitive peoples survives in the unconscious of civilized man out of which the neuroses develop, as for instance, the similar part played by the *délire de toucher* in the compulsion neuroses, the dread of the transfer of the taboo.[6]

However, even modern medicine, either from the standpoint of medical science as a whole or on the part of the physician who may unconsciously direct his observations and motives, is not entirely free from this loose and undirected thinking, a sort of attempt to harmonize conscious thinking with unconscious wishes. This, in itself, is a proof of that collective unconscious which links us to the primitive and archaic past. Such tendencies are shown for instance in the realm of pharmacology, where the success of a drug, which has no physiological action, is in reality only a psychotherapeutic effect.

It seems from analysis of this material, that the homoeopathic formula of like cures like, may have had its remote origin in sort of a symbolic rationalization of these primitive magic formulae. Hahnemann's theories, "the rent in the robe of Aesculapius," to use Osler's vivid expression, are probably a survival of the old Paracelsian doctrine of signature, namely,—that diseases or symptoms of diseases are curable by particular drugs which produce similar pathologic effects upon the body.

Thus the whole of medical magic is unconsciously governed by what men wish, instead of by the actual facts of disease. It is a sort of undisciplined or undirected primitive thinking, in contradistinction to modern scientific medicine, which is of the nature of a directed or disciplined thinking. Medical magic, like all magic, is man's belief in his own omnipotence, a feeling that his desires and wishes, will in some expected or unexpected manner, become realized.

There still exists in all of us, remnants of these beliefs or tendencies in magic, a sort of assurance in our omnipotence to cure disease, thus linking us unconsciously with the remote past and with the primitive medicine-man. The best example of this, is the blind and uninquiring use of medical lore which past centuries have accumulated, a lore based upon loose methods of thinking, before clear scientific conceptions begin to be formulated. If medicine advances in the future, it must be content with nothing but the facts, with disciplined thinking, and not with that autistic, undisciplined thinking in medicine, which Bleuler has so well described and which governs us by what we wish, by our unconscious attitude toward disease instead of by actual facts concerning disease. The various trends in medical history can be understood only if we understand human beings, as mere academic speculations about scientific discoveries can never make them clear.

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[6] See on this point Freud's Totem and Taboo—Resemblances between the Psychic Life of Savages and Neurotics, 1918.

Thus the motives of magic are the wishes of men, in this case, the wish to cure that which was so mysterious to primitive man, namely disease, as disease more than any other calamity rendered him weak, easily assailable, and consequently of little or no value to the tribe. Since primitive man possessed great confidence in the power of his wishes, he had what is termed in modern psychology, an omnipotence of thought. Now this omnipotence of thought survives in all of us in certain phases of the practice of modern medicine, such as for instance in the use of suggestion, a belief that a wish to make a neurotic patient well will make him well, or in the administration of certain drugs or compounds to cure disease, substances which have no physiological effect, but which act in what may be called the materialistic carriers of our therapeutic wishes.

A further brief consideration of the survival of omnipotence of thought in modern medicine, in the form of the previously mentioned suggestion or suggestive therapeutics, may not be without interest. Suggestion is a form of undirected thinking, a sort of magic. It confers a feeling of omnipotence on the part of the operator, because like magic, the object of suggestion is an attempt to make non-existent the symptoms of a disease, particularly of a mental disease or a functional nervous disorder. This is clearly seen in the early history of hypnotism, when it was believed that the hypnotist transferred his vital force to the person hypnotized. The so-called "vital fluid" of the earlier mesmerists is merely an unconscious survival of the same belief which actuated the primitive medicine man in his attempts at medical magic, a belief which has played an extensive part in what may be termed the medical fantasies of mankind.

This omnipotence of thought in suggestion is motivated from unconscious thinking, it is a personal, an egotistic, overestimation of the psychic processes as opposed to reality. In primitive medical magic and in modern suggestion, these thoughts are supposed to exert an unlimited effect on reality, a sort of a wish that some power can emanate from thinking which may have a favorable effect in the cure of disease.

Another interesting phase of medical magic which merits brief description, because so closely linked up with the previously described taboos of childbirth, is what is comprehended under the general term of couvade. The couvade may be described as that custom of primitive peoples, in which the father rather than the mother is confined to bed on the birth of a child, receiving the delicacies and careful attention usually given to the mother among civilized races and furthermore subjecting the father to a series of vigorous taboos in order to safeguard the welfare of the newly born infant.

According to Frazer, the couvade may be divided into two rather distinct groups:

1. The prenatal couvade which aims, according to the principles of homeopathic magic, at a magical transference of the mother's labor pains to the father, the latter pretending to undergo the pangs of childbirth.

2. The postnatal or dietetic couvade, in which the father pretends to undergo the physical experiences of the puerperium by simulating weakness and refraining from eating certain foods.

The psychological basis of the couvade is very interesting, as it concerns itself mainly with ambivalent feelings toward the wife, unconscious hostile feelings toward the newly born child who tends to supplant temporarily the father in the mother's affection and finally sort of a crude superstition that the husband's behavior will thus, through homeopathic magic, minimize the parturition pains in the mother. In modern times fragments of this archaic thinking seem to have survived, for instance, the objection formerly taken to the use of anaesthetics in obstetrical practice, on the ground that the pain in childbirth was a punishment for sin and it was consequently undesirable to use any means to minimize or alleviate it.

On the transference of evil to inanimate objects, which is really the homeopathic principle of vicarious suffering, is based the magic cure of epilepsy. For instance, Frazer states:[7]

> Fortunately we can shew that the analogy which is thus assumed to exist between the Roman custom and modern superstition is not merely a fanciful one: in other words, it can be proved that the Romans, like modern clowns, did believe in the possibility of nailing down trouble, in a literal and physical sense, into a material substance. Pliny tells us that an alleged cure for epilepsy, or the falling sickness, was to drive an iron nail into the ground on the spot which was first struck by the patient's head as he fell. In the light of the modern instances which have come before us, we can hardly doubt that the cure was supposed to consist in actually nailing the disease into the earth in such a way that it could not get up and attack the sufferer again.

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[7] Frazer, The Scapegoat, pp. 68–69.

THE CADUCEUS AND ITS SYMBOLISM

By ROBERT WILSON, JR., M. D.

CHARLESTON, S. C.

THE association of the Caduceus with Hermes, or Mercury, the messenger of the gods, and the patron of trade, seems to give no intimation of its right to become the accepted symbol of the medical profession. This right, indeed, has been called into question and the staff of Aesculapius with a single serpent twined around it, is regarded as the correct emblem. The symbolism of the serpent, however, is the same in both, but the winged Caduceus probably embodies an interesting combination of two primitive cults which were associated with the earliest conceptions of the healing art.

According to Garrison,[1] the Caduceus was first used as a medical emblem in the sixteenth century when Johann Froeben, publisher of medical books, employed it as a title page device; and a little later Sir Wm. Butts, physician to Henry VIII, used it on his crest. What suggested its use in these instances instead of the Staff of Aesculapius is not clear.

About the middle of the nineteenth century the medical publishing house of J. S. Churchill, of London, employed the Caduceus, and in 1856 it was used on the chevrons of hospital stewards in the United States Army. Later it was adopted by the U. S. Public Health Service, and in 1902 by the United States Army as a designation of medical officers. The Royal Army Medical Corps use the staff with the single serpent which is the form now appearing on the button of the American Medical Association.

The most ancient illustration of the Caduceus which is known is upon the libation vase dedicated by Gudea, King of Lagash, to the god Ningishzida. This figure does not show the wings which usually appear upon the Caduceus of Greek and Roman mythology. This interesting vase was unearthed upon the site of Lagash and Frothingham thinks it indicates the Assyrio-Babylonian origin of the Caduceus which ultimately found its way from Accad and Sumer into the later Greek and Roman civilizations. The date of this vase he places at 3,500 B. C. which corresponds to the beginning of the dynastic period in Egypt. Other chronologies, however, place the accession of Gudea nearly a thousand years later, or about 2,450 B. C. which is about the beginning of the ninth Egyptian dynasty. But already in predynastic Egypt the symbol of the two serpents appears upon the monuments, although not in the identical form as upon the Lagash vase.

The question of the origin of civilization is still under discussion, but the weight of evidence indicates that the civilization of Egypt antedated that of the Mesapotamian states and was the source from which the latter derived much of their culture. We must therefore revert to the history of the older culture and the symbolism in which its conceptions found expression in order to reach an understanding of the real meaning of the winged Caduceus and of its association with the healing art. This leads us to a consideration of two very early forms of worship in which the struggling faith of man took form, serpent worship and sun worship.

The serpent cult originated very early in Egypt, the proto-Egyptians,[2] according to Elliott Smith, being serpent worshippers. Its origin is obscure and need not be discussed in this connection. What interests us here is its early association with the idea of health. Wake[3] says:

> One of the leading ideas connected with the serpent was, as we have seen, its power over rain, but another equally influential was its connection with health. That the idea of health was intimately associated with the serpent is shown by the crown form of the asp, or sacred Thermuthes, having been given particularly to Isis, a goddess of life and healing.

The idea of this association persisted for many centuries and became widespread, appearing for example in Gaelic and German folk-lore as a belief that "the white serpent when boiled has the faculty of conferring medicinal wisdom." In the book of Genesis the serpent personifies the evil one and typifies subtlety and cunning; but in Exodus, Moses sets up a brazen serpent-image as a healing agent and it seems to have occupied a place in the worship of the Israelites down to the time of Hezekiah.[4]

Whether serpent worship originated in phallicism or whether the latter developed at some later time is difficult to determine, but at any rate the serpent very early became a symbol of the phallus, the venerated emblem of life and regenerative power. The particular variety of serpent which seems to have possessed special significance was the *cobra di capello;* and it is clearly this serpent which is figured on so many Egyptian monuments. The sacred uraeus was doubtless the cobra and not, as Max Müller[5] suggests, the asp.

It is a curious and interesting fact that serpent worship and sun worship are found invariably and universally associated. The worship of the sun was probably of earlier origin. Primitive man soon traced the connection between sunshine and the blessings of life and health, and so set up the source of this beneficent influence as the main object of his worship. In his effort to personify in some familiar form this mighty and powerful being who every day moved across the heavens dispensing light and warmth, health and life, the early Egyptians "sought to describe it as a hawk which flew daily across the sky. Therefore, the most popular forms of the solar deity, Rê and Horus, have the form of a hawk or of a hawk-headed man,[6]" and at the beginning of the dynastic period the worship of Horus was general throughout Egypt. Instead of being represented always by the complete figure of a hawk, Horus is often symbolized merely by two outstretched wings, or by a winged disc. This winged disc was carried from Egypt to Assyria and Babylonia where it became a common and familiar emblem. In the predynastic period before the northern and southern kingdoms became united, serpent worship flourished especially in Lower Egypt and the capital Buto with its protecting serpent-goddess was the center of the cult, but in both kingdoms "the hawk-god Horus was worshipped as the distinctive deity of both kings." When the two kingdoms became united under Menes about 3,400 B. C., the symbols of the two cults began to appear side by side, and later the king who was the sun-god's representative upon earth adopted the sacred uraeus of the north, which he wore upon his forehead. Elliott Smith[7] is of the opinion that this union of sun and serpent worship was the beginning of an association which later spread over the world. He says:

> The fact that the dominion of the sun-god Rê (or Horus) was attained in the northern capital, which was also the seat of serpent worship, led to the association of sun and serpent. From this purely fortuitous blending of the sun's disc with the uraeus, often combined, especially in later times, with the wings of the Horus-Hawk, a symbolism came into being which was destined to spread until it encircled the world from Ireland to America.

The staff of Aesculapius with its single serpent had doubtless a similar Egyptian origin. The Aesculapian cult may be traced to Egyptian sources and the knotted staff with its serpent of later times was probably derived from the sacred uas staff. An interesting relief from the tomb of Amenemhet I, shows the hawk-headed god Horus presenting the crux ansata, the symbol of life, to the royal hawk which surmounts the Horus name of Amenemhet, behind which is a uas staff with a serpent twined around it, a symbolic representation of the author and giver of life and health conferring upon his earthly representative these divine powers.

The emblems peculiarly indicative of healing would naturally be associated with the special divinity presiding over health, and hence Hermes, who was worshipped in Boeotia as the averter of disease, and who was identified with the Egyptian Thoth, god of letters and of wisdom in general, who also was said to have invented the healing art, most appropriately carried them. There may be another significance in the association of the serpent with Hermes which we cannot overlook. Herodotus[8] says that he was figured by the Pelasgians, who were the prehistoric inhabitants of Greece, as a phallic deity, in which case when the phallic symbolism of the serpent is recalled we readily understand an association whose real meaning became lost when the original phallic character of Hermes was forgotten. The function of Hermes as messenger later seemed to dominate his other functions, and the emblem which he bore at first because he was a god of healing, or a phallic deity, became the kerykeion, or herald's staff. The winged cap and winged sandals also are generally supposed to have been worn because he was the messenger of the gods, but it is quite probable that these as well as the wings of the Caduceus were originally the emblem of the sun-god Horus. A faint memory of the Horus origin of the wings of the Caduceus perhaps lingers in the myth which narrates that Hermes received the emblem in exchange for the lyre from Apollo, who was a sun-god; and it may be of some significance, too, that the hawk was one of the animals sacred to Apollo.

Whether the Caduceus in its present form originated as an Egyptian or as an Assyrian device, the symbolism which it represents dates back to predynastic Egypt. It bears a silent witness to the union of two ancient kingdoms which marks the beginning of history, and to the fusion of two primitive cults whose emblems indicated to man the divine source of life and health, while the use of these ancient emblems to symbolize the medicine of today brings us into touch across the space of more than fifty centuries with the crude primitive beginnings of the healing art and man's earliest striving after truth. The beneficent influence of the symbolic wings of the sun-god doubtless inspired the beautiful words of the prophet Malachi in which we may now see a new meaning and a deeper significance: "Unto you that fear my name shall the Sun of Righteousness arise with healing in his wings."

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DR. GEORGE CHEYNE AND THE "ENGLISH MALADY"

By HON. WILLIAM RENWICK RIDDELL, LL.D., F.R.S. (CANADA)

President Canadian National Council for Combating Venereal Disease

IT is an inveterate and almost universal custom to call a disease by a name indicating a foreign origin. It is difficult for the ordinary mind to look upon disease as a phenomenon arising naturally from native causes or to attribute it to anything but the hated foreigner or the act of a malign deity.

The latter conception gives us the *Lues deifica* or *divina* (epilepsy), the former made the French speak of *Lues Neapolitana* or *Mal de Naples*; the English, of the same disease, as *Lues Gallica, Morbus Gallicus* or French Pox; the Italians, the French disease;[1] the Russians call influenza, Chinese catarrh; the Germans, Russian pestilence; the French, Italian fever (they also speak of *gout italien*), or Spanish catarrh. In the war of 1812, the Americans called the "Cold Plague"[2] (almost certainly a malignant type of influenza with pneumonic complications), the Canadian fever; and but the other day we had the Spanish Flu, which is no more Spanish than German measles are German.

Perhaps the most amusing example of the tendency to call a disease after those who are disliked, is that in President Jackson's time in the United States, the Whigs and "Tyler Democrats" called influenza, "Jackson's itch," while Jackson's partizans called it "Tyler's grippe." *Der Englische Schweiss*, the English Sweating Sickness, was a term well known to the German medieval writers on medicine; although it had some right to the name English as it seems generally (if not always) to have begun in England, English physicians objected to the appellation as conveying an unjust accusation against their country.

But the case was different with the "English Malady." The responsibility for that disease the English physicians admitted, if, indeed, they did not rather boast, England must assume.

Everybody till near the end of the eighteenth century knew what the "English Malady" was. I fear that few could now define or identify it. It ran all the way from "crankiness" from an overloaded stomach and *primae viae*,[3] lowness of spirits, "the spleen," "vapours," "melancholy," hysteria, hypochondria, to actual insanity of the melancholic type.

The literature of the sixteenth, seventeenth, and eighteenth centuries is full of references to "melancholy." A fine example is found in Burton's "Anatomy of Melancholy," a book of immense erudition, showing unwearied diligence in the examination of the older writers and great skill in the marshalling of facts as well as of fancies.

This "melancholy" was practically synonymous with the "English Malady"; it was supposed to be due to an excess of Black Bile, melaina chole, one of the four "cardinal humours" of the current physiology, the others being Blood, Phlegm and (yellow) Bile. While this black bile was wholly natural, the thought seldom was very remote that it was corrupt and dangerous to health. It must, however, be said that Galen "On the Natural Faculties" ii, ix, 135, does speak of black bile in the normal condition, and on p. 138 says that overeating produces the abnormal forms of both black and yellow bile. Hippocrates "Aphorisms," iii, 20, places the melancholic between the maniac and the epileptic, and vi, 23, makes the (or at least *a*) cause, long-continued fear or downheartedness. Indeed, the Greek physicians not infrequently spoke of it as diseased; one of our own old writers says that it "is sumwhat stynkyng & is clepid malancoli."

The most celebrated writer on the "English Malady" was Dr. George Cheyne, one of the earliest vegetarians.

Born in Aberdeenshire in 1671, he received a good classical and mathematical education, and subsequently became a pupil of the well-known Archibald Pitcairn who had been a professor of medicine at Leyden but was then in the same chair at Edinburgh. Pitcairn was a prominent, perhaps the most prominent, member of the "iatro-mathematical" school of medicine, whose theory of physiology and disease was largely mechanical, as contrasted with the chemical theory of the "iatrochemical" school. The latter school attributed to "fermentation," *i.e.*, what we would call chemical action, practically all the physiological actions of the body—"effervescence," and "vital spirits," are familiar terms in their books; the former looked rather to the solids, mechanical trituration, pressure of the intestines, motion of the thorax, etc.

Cheyne was a good mathematician. He wrote on "Inverse Fluxions," what we call the Integral Calculus,[5] and he adopted Pitcairn's system with enthusiasm. He published an account of Pitcairn's theory of fevers, and had a controversy with Dr. Charles Oliphant on the subject. Coming to London, he was made F. R. S. in 1701, and obtaining the degree of M. D. (it is not known from what University), he began the practice of medicine there.

Having theretofore led a sedentary and temperate life, he made an entire change on coming to London. As well for business reasons as for pleasure, he frequented the society of free livers and bottle-companions; and with his Aberdonian constitution, "he bore for some years a course of tavern dinners and other social festivities."

But the inevitable result followed; his health gave way, he became corpulent and unwieldy; and like a wise man, he changed his mode of life. Living a temperate life, with a very restricted diet, he soon recovered his health and figure, if he did lose much of his practice and many of his jolly friends. He took a course of the waters at Bath; and after alternating for some time, wintering at Bath and summering in London, he took up his permanent residence at Bath and continued the diligent practice of his profession. Abandoning his restricted, for a moderate diet, he became corpulent again, weighing, it is said, 32 stone (448 pounds); but he recovered through the use of a milk and vegetable diet, living for sixteen years on bread and milk alone. He died in 1743, at the age of seventy-two.

His best known work—he wrote on mathematics, natural philosophy, and religion as well as on medicine—is "The/English Malady/or a Treatise/of/Nervous Diseases of all Kinds/as/Spleen, Vapours, Lowness of Spirits, Hypo-/Chondriacal, and Hysterical Distempers, &c." (A former owner of my copy has added "Epilepsy.") It was first published in London, 1733; my copy is of the 6th edition, London, 1735 (not 1739 as the D. N. B., x, 219, has it); it is an 8 vo. of 370 + xxxii + xvi pages, contemporary calf, gold-tooled.

Of the three parts, the first is "On the Nature and Cause of Nervous Distempers"; the second, "Of the Cure of Nervous Distempers"; and the third, "Variety of Cases that Illustrate and Confirm the Method of Cure with the Author's Own Case at Large." On the general title page he quoted Vergil's lines:

> . . . Facilis descensus Averni Sed revocare Gradum, superasque evadere ad Auras Hic Labor, hoc Opus est . . . .[6]

The truth of which so many have found by bitter experience. To the first part he prefixes Persius' somewhat complimentary:

> Nec te quaesiveris extra—Judge for yourself.[7]

to the second, Horace's lines:

> . . . . Nunc retrorsum
> Vela dare, atque iterare cursus
> Cogor relictos. . . . .[8]

Now I am compelled to sail back and return to the courses which I had abandoned—

a very apt motto indeed. To the third part, he prefixes Homer's description of the noble Scythian Hippomolgi, "Mare-milkers:"

> Simple in maners, poor, living on milk, the most honorable of men.[9]

In the preface, Cheyne has no hesitation in attributing the prevalence in England of the English Malady to "the moisture of our air, the variableness of our weather (from our situation amidst the ocean), the rankness and fertility of our soil, the richness and heaviness of our food, the wealth and abundance of the inhabitants (from their universal trade), the inactivity and sedentary occupations of the better sort (amongst whom this evil mostly rages), and the humour of living in great, populous and consequently unhealthy towns"; and he computes these nervous disorders to make almost one-third of all the complaints of the people of condition in England.

When he comes to giving the sources and causes, the etiology in a word—he absolutely ignores what had originally been considered the cause, namely, excess of black bile. Dr. John Quincy, an apothecary of London, in his lexicon, "Physico-medicum," published in 1717 (my copy is of the edition of 1722), said: "Melancholy (is) supposed to proceed from a redundance of black bile; but it is better known to arise from too heavy and viscid a blood." Cheyne admits as the first of the three most universal and comprehensive sources and causes of chronical distemper, a "glewiness, sizyness, viscidity or grossness of the fluids either accidental and acquired . . . or original and hereditary . . . ,"[10] the other two being "some sharpness or corrosive quality in the fluids" and "a too great laxity or want of due tone, elasticity and force in the fibres in general or the nerves in particular."

But as to the general causes of nervous diseases, Cheyne gives:

> (1) The solids and consequently the fibres and nerves . . . becoming either too dry or too moist; (2) by improper, hard, solid and noxious particles getting into their substances which may gradually alter, spoil and stop their natural texture and functions . . . whether vibration, intestine action and reaction or collision of their small parts, or however they act or are acted upon to convey and propagate the sensations or influences of external bodies to the seat of the intelligent principle.

The third cause is like Dr. Quincy's theory:

> (3) From the interruption, interception and stoppage of their vibrations, tremors and the intestine action of their component particles by the greater pressure of too viscid juices in the blood vessels and the other tubes that contain the animal juices surrounding these fibres or nerves . . . ; (4) from the natural or acquired weakness and laxity of their tone and elasticity; whether from a natural or accidental ill structure. . . of themselves or the other organs of the body or from any external injury received on them.

And he concludes that:

> All nervous distempers whatsoever, from yawning and stretching up to a mortal fit of apoplexy . . . (are) but one continued disorder or the several steps or degrees of it arising from a relaxation or weakness and the want of a sufficient force and elasticity in the solids in general and the nerves in particular in proportion to the resistance of the fluids in order to carry on the circulation, remove obstructions, carry off the recrements[11] and make the secretions.

The doctrines of the iatromathematical school are plainly apparent: "The disorders of the solids are chiefly what are to be had regard to," not the bad state of the fluids which is important only in its effect upon the solids.

There is no difficulty in translating Cheyne's language into modern terminology. A nervous affection depends upon the state or condition of the nerve-fibres. If they are (*a*) atonic (*b*) overdry or overwet (*c*) infiltrated with foreign solid particles or (*d*) overpressed by the blood or other fluid, their functions are interrupted and nervous disease follows, more or less severe.

He recognizes, too, that there may be nervous affections produced by trauma.

The classification of nervous diseases is interesting; they are:

1. Those which are attended with a partial or total loss of sensation for some time; and include lethargic dullness, fainting fits and complete apoplexy.

> These arise from a Grossness, Glewiness or Viscidity of the animal juices . . . which obstructs the Glands, the serous Pipes and the capillary Blood vessels, and thereby breaks, interrupts and weakens the vibration and Tremors or whatever else is the action of the nervous Fibres properly so called.

2. Those which are attended with a loss of voluntary motion or "shakeing" in any particular organ or limb or in all the instruments of voluntary motion.

> Such are all those of a paralytic kind from an universal palsy, a hemiplegia . . . or of a particular limb to a deadness, numbness, weakness, or coldness . . . . this class . . . owes its origin to a weakness, imbecility and loss of due tone in the nervous system . . . whereby the soul is disabled to communicate its energy a principle of motion to the muscular fibres.

3. Those attended thus:

> With spasms, cramps, convulsions or violent contractions of the muscles . . . all of the convulsive tribe from hypochondriacal and hysteric fits or the convulsions of the epileptick kind down to yawning and stretching. These seem to be produced by some hard pointed concretions, saline particles or some noxious acid or acrimonious steam, wind or obstructed perspiration lodged in the small vessels or upon any place where there are the greatest collections of nerves, viz., in the alimentary tubes, the cavities of the brain, the trunk of the body or the interstices of the muscles where, twitching, stimulating and wounding the nerves or their membranes, it raises a general disorder in the whole nervous or sensible fibres whence the same is derived upon the whole muscular system, and there provokes violent throws, contractions, cramps, and spasms, until, tormenting and wearying out the elastic fibres at last by these strugglings and efforts, the destructive matter is discharged or removed.

(He compares these phenomena to earthquakes.)

There follows a somewhat elaborate description of the true nature of the fibres and nerves, and of "animal spirits," a whole system of philosophical conjectures, and of symptomatology.

Part II deals with the treatment of nervous distempers; and Cheyne has three "Intentions,"[12] of which the first is to thin, dilute and sweeten the fluids and destroy their viscidity and "glewiness"; the second, to break and dissolve the saline, acrid and hard concretions, and make the juices soft, sweet and balsamic; the third, to restore the tone "to crisp, wind up and contract the fibres of the whole system."

For the first "Intention," he uses "Mercury and its preparations, calomel, mercury alcalisated, Precipitat per se, Quicksilver, Silva-Water, Aethiops Mineral, Cinnebar of Antimony, Antimony Diaphoretic, Bezoar Mineral, Crude Antimony, Bezoardicum Joviale, Salt of Tin, Ens Veneris," &c. Also "Guajacum, Sassafras, Sarsaparilla, Lignum Nephriticum, Saunders, Aloes," and certain Fixed Salts, such as, Salts of Tartar, Salts of Wormwood, Broom, Fern and antiscorbutic plants.[13]

Calomel is to be used as "an Alterative only and not an Evacuant . . .two, three or four grains, once, twice or three times a day."

The successful termination of the first "Intention" is to be determined by the state of the blood taken by bleeding, a few ounces only: "if the serum be clear or not too tawny . . . the first intention has been pursued sufficiently."

For the second "Intention," Dr. Cheyne recommends water, "Gum Ammoniacum, Galbanum, Assafoetida, Sagapenum, Myrrh, Guajacum, Camphire, Castor, Amber, Salt of Hartshorn, Salt of Amber, Salt and Spirit of Human Skull and of Raw Silk, Castile

Soap, Saffron, Garlick, Horse-Radish and the like," to drink freely of mineral waters, and in want of these, Barley water, syrup of marshmallows, Decoction of Comfrey-Roots, Syrup of Mulberries and Sweet Cow-Whey.[14]

When the symptoms are abated and tolerable ease is obtained, the third "Intention" follows: "Bitters, aromaticks and Chalybeats . . . Jesuits' Bark, Steel, Gentian, Zedoary, Cassamunair, Calamus aromaticus, snakeweed, Contrayerva, Cinamon, Winter's Bark, Chamomile Flowers, Wormwood and Century-Tops, Terra Japanica . . . Oak Bark and its offspring, the Mistletoe and Acorns"; Jesuits' Bark being much preferred.[15]

Now follows the most important and useful part of the book, although it is to be doubted if either Dr. Cheyne or his contemporaries thought so. The aetiology and pathology of the times were erroneous, ludicrously so to a modern physician; the treatment was not fated to last, but the "Regimen of Diet proper" at that time, is proper today. It is probable that the undoubted success of Dr. Cheyne in the treatment of disease, nervous or otherwise, depended much upon his "Diaetetick management." The solid food should be "tender, light and easy of digestion," the quantity "proportioned to the strength of the digestion and the waste and decay of the fluids from exercise or body action or to the present fulness of the habit." Opiates and anodynes are prohibited, and in many cases a total milk and vegetable diet is recommended. Exercise should be "without the least exception or limitation, but so far as the strength can admit . . . without weakening, fatigue or hurry of spirits." Horse-back riding is the best; next, riding in a chaise or chariot; but "walking . . . will answer the same end and purpose, as well as any, and may be more readily and easily used . . . within doors and without, in winter as well as summer." Hunting, shooting, bowls, billiards, shuttlecock, &c., are recommended for those who like sports; strongly working the arms backward and forward, the flesh brush, &c. &c.

Remembering what "Nervous Distempers" were in his terminology, few will dispute Cheyne's statement—"A vicious liver seems to be one of the primary and immediate causes of nervous Distempers," although few will agree with him that "The liver is the organ designed by nature . . . to suck out, draw off and convey into the common shore[16] of the Body (the Intestines), all the Poison, malignity and destructive Part of high rank foods and too great a Quantity of rich Liquor taken into the Habit."

The author deals with "vapours" and their treatment, nervous disorders of the "Convulsive Tribe," nervous colics, palsy, St. Vitus's dance and other paralytic disorders, and closes this part with a chapter on Apoplexy and Epilepsy.

He makes three kinds of Apoplexy: (1) Symptomatic, "from a translation of the gout, rheumatism, etc."; (2) accidental (*i.e.*, traumatic); (3) acquired, "arising from an apoplectick disposition or discrasy,[17] proceeding from intemperance and excesses, laziness and neglect of the non-naturals . . . ."

The immediate causes are two: (1) Extravasation of blood, traumatic or otherwise, and (2) "Ouzing out thro' the sides of the relax'd and worn out capillary Blood vessels of a thin putrid serum . . . chiefly with gross and full feeders . . . those who are too free with strong and spirituous liquors and are consequently very inactive and lazy."

Epilepsy and epileptic fits are graphically described; and we have the comforting statement that "Dr. Taylor, of Croydon, cured himself entirely and absolutely of the most violent, constant and habitual epilepsy[18] that perhaps ever was known, after having, in vain, tried all the methods and medicines advised by the most eminent physicians of his time, by a total diet of milk without bread or any other vegetable or thing (besides a spoonful of compound peony water sometimes to prevent its curdling), confining himself to a pint in the morning, a quart at noon, and a pint at night, of the milk of grass fed cows in the summer, and of those fed with hay in the winter."

NOTES

[1] Fracastoro who invented the word "syphilis" and used it first in his "Syphilidis sive morbi Gallici libri tres." (Verona, 1530), speaking of the disease as connected with the invasion of Latium (Italy) by Charles VIII, King of France in 1404 and 1495, says:

". . . in Latium vero per tristia bella
Gallorum irrupit nomenque a gente recepit."

Lib. I, vv. 5, 6.

"It broke into Italy in fact by the unhappy wars of the French and took its name from that nation."

[2] See my article, The Cold Plague of the War of 1812–14. *The Lancet*, London, March 11, 1922, pp. 512, sqq.

[3] "Primae viae" is a favorite expression of Cheyne's for the alimentary canal—the "Common Shore" (Sewer) of the body as he calls it.

[4] In his book, "An Essay on Regimen," London, 1740, Cheyne attributes to the mother, the juices or fluids of the body "because the solids. . . come from the father alone and it is only in and by them that health, long life, and serenity are to be had"(p. iii).

[5] It was not until the first quarter of the nineteenth century that Newton's Fluxions and Fluents were displaced at Cambridge by Descartes' Differentials and Integrals. This was due to the efforts of Sir John Herschel, (Dean) George Peacock and Charles Babbage—the chief symbol of the fluxional method being a dot, and that of the differential method a "d"; this change was said to be from the dotage of Newton to the deism of Descartes.

[6] Vergil, Aeneid, Lib. VI, vv. 126, 128, 9 (the more usual reading is "Averno," but Averni has good authority).

"Easy is the descent to the lower regions
But to retrace the steps and to rise to the upper
That is the task, that the difficulty."

[7] Persius, Satires, I, v. 7.

"Do not seek further" for a judge, examine things for yourself and form your own opinion.

[8] Horace, Carmina, Lib. I, 34, vv. 3–5, Horace's words when he was converted from being

"Parcus Deorum cultor et infrequens,"

by hearing thunder from a cloudless sky.

[9] Homer, Iliad, N, v. 6.

[10] Fracastoro, Syphilidis, Lib. ij, vv. 67–70, speaking of the hope of recovery from syphilis says:

" . . . . . . tibi sit morbo spes major in illoe
Sanguine qui insedit pure; verum quibus, atra.
Bile tument, spissoque resultant sanguine venae
Major in iis labor est, pestisque tenacius haeret."

"You have the greater hope in this disease whose blood is pure; for those whose veins swell with black bile and beat with thick blood, the task is greater, and the disease clings more tenaciously." His views were those of practically all the best physicians of his time and long after. I give but one example: Perhaps the best French writer on venereal diseases in the eighteenth century—at least second to the celebrated Astruc only—was Fabre—in his "Traité des Maladies Vénériennes," 4th Ed., Didot, Paris, 1782, he says (Pref. p. vii): "Tous les Auteurs ont consideré le virus vénérien comme un délétère qui épaissit toutes nos liqueurs et particulièrement la lymphe"; and he describes the action of mercury, "en brisant, atténuant les fluides, trop épais et en rétablissant ainsi la liberté de la circulation jusques dans les plus petits vaisseaux."

[11] "Recrement" properly means a fluid which is separated from the blood and is again in part absorbed into it, as the saliva or bile; but it is often used as synonymous with excrement. It corresponds with the "perissoma" of the Greek physiologists.

[12] "Intention" was properly the object aimed at in treatment, the medieval "curiationis intentio"; but it had the secondary meaning of the method of treatment itself. In my time, we had wounds healing with the first intention, *i.e.*, without granulation, or with the second intention, *i.e.*, with granulation.

[13] Cheyne's preference was for Galenical over Chymical medicines (the latter produced by the "torture of fire," the use of which was very largely due to the influence of Paracelsus); he was, however, rather catholic in his practice as will be seen by comparing his list of medicines with Dr. Quincy's "Pharmacopoeia Officinalis et Extemporanea," London, 1749. Calomel is of course the "mighty (or mite) chloride"; Mercury alicalisated is "mercury killed with any calcined body" (as Cheyne puts it in his "Essay on Regimen," London, 1740, p. 112) and so become alkaline. Quincy (p. 100) gives the prescription of both the London and the Edinburgh Dispensatory—3 drachms purified Quicksilver, 5 drachms of prepared Crabs-Eyes, rubbed in a glass mortar till they are incorporated; and he says "crabs-eyes are a stony concretion in the head of the craw-fish and not the eye of the creature" (p. 95). Precipitat. per se, is the dangerous white precipitate in Cheyne's time abandoned even by the Vienna School; Silva water or Selva water, a liquid preparation of mercury; Aethiops Mineral, prepared from mercury and sulphur ground together and sometimes heated in a crucible—there were many kinds: Cinnabar of Antimony, Sulphite of Antimony: Bezoar, the concretion from the stomach of certain deer, goats, llamas, guanacos, etc. esteemed almost as a panacea: Bezoardicum Joviale, a preparation of tin—anything considered an antidote to poison was bezoardic, while Joviale came from Jove

or Jupiter, in Alchemy, Tin, as in Astrology the planet Jupiter.

Ens Veneris "sublimated from equal parts of the calcined powder or Cyprus vitriol and of Sal Armoniack"—literally "Venus Essence" or "Essence of Copper" (Venus being in Alchemy, Copper, as in Astrology the planet Venus)—Cyprus vitriol was Copper sulphate, Sir Kenelm Digby's "Powder of Sympathy."

Guaiacum had been in Fracastoro's time the great specific for syphilis, but by Cheyne's time it had lost its vogue and mercury was almost universally administered (except by quacks). The enormous number of mercury preparations in use is indicated in a passage from Fabre's work, mentioned above (Note 10). He says (p. 28):

"Il y a peu de remédes sur lesquels on ait fait tant de recherches, que sur le mercure . . . On l'a transformé d'une infinité de manières, croyant toujours le trouver plus spécifique sous une forme que sous l'autre: de-là ce nombre infini de préparations mercurielles qu'on donne intérieurement, comme les différentes especes de précipité, d'aethiops, de panacées, de dissolutions, de sublimés, et tant d'autres compositions. . . "

"There are few remedies upon which so many researches have been made as upon mercury. . . it has been transformed in an infinity of ways, in the constant belief that it will be found more specific in one form than another, hence the infinite number of preparations of mercury which are given internally, such as the different kinds of precipitates, aethiops, panaceas, solutions, sublimates and so many other compounds."

Lignum Nephriticum was the wood from which the sovereign Nephritic Tincture was made. In early times it was said, like Guaiacum, to come from New Spain, being the Coatli of Hernandez; but later, and in Cheyne's time, it was generally the wood of the Horseradish tree. Moringa pterygosperma—the tincture was administered in diseases of the kidneys.

[14] Salt and Spirit of Human Skull were frequently administered—the moss from a human skull, "usnea" as it was called, was the active element in Paracelsus' Weapon Salve or Vulnerary Ointment which, applied to a weapon, healed the wound which had been made by it.

Quincy says p. 78: "Cranium Humanum, *Man's Skull.* It is to be feared this has obtained a place in medicine more from a whimsical philosophy than any other account; and therefore we find it appropriated to different tempers of the head chiefly; as apoplexies, epilepsies, and the like. It is an ingredient in *Riverius's Pulvis de Gutteta*, but of little service. A spirit indeed is made from it, and a volatile salt, in the same manner as from hartshorn; from which they differ so little, as not to be distinguished even by the operator." It was, however, officinal.

Sagapenum is a bitter red to yellow gum with an odor like garlic, formerly used as an antispasmodic and emmenagogue; it is the juice of the Ferula Persica.

[15] Jesuits' Bark is Cinchona; Zedoary is the same as Cassamunair.

Cassamunair, Cassumunar, etc., the tuberous root of an East Indian plant probably Curcuma aromatica: it is warm, bitter and aromatic like ginger.

Calamus aromaticus, an eastern aromatic plant or plants, perhaps the Andropogon Schoenanthus, the sweet-scented lemon grass of Malabar *not* the native English Sweet Flag or Sweet Rush, Acorus Calamus (see Dr. Quincy's "Pharmacopoeia").

Snakeroot any of the Sanguinarias. Contrayerva, the root stock and rhizomes of the Dorstenia Contrayerva, a native of tropical America, a stimulant and tonic and antidote to snake-bites.

Winter's Bark was so called from Capt. W. Winter who first brought it to England. It is an astringent and aromatic bark from the Drimys Winteri or Winterea Aromatica growing on the Western parts of America from Mexico south to Cape Horn. It is often replaced by the bark of Canella Alba (or Winteriana) or Cinnamodendron Corticosum of the West Indies. Paratudo Bark is also a variety.

Century is Centaury Chlora perfoliata or Erythraea, Centaureum; Terra Japenica or Japonica, Catechu.

[16] See Note 3.

[17] The health was believed by most ancient and medieval physicians to depend upon the proper "crasis" of the humors or fluids of the body—"krasis" being the Greek word for a mixture in which the ingredients lose their identity, not like a mixture of peas and beans which would be called "mixis." Dyscrasis, dyscrasy, discrasy, means a mixture of the humors in wrong proportions, the opposite of eucrasia, the Latin "Temperamentum."

[18] In his "Essay on Regimen" Cheyne says, p. 45: "It is not easily to be credited what wonderful effects even in the most desperate and universally condemn'd to death distempers, I have seen performed by a Regimen of Milk and Seeds only, duly and obstinately persisted in, especially in persons under fifty. Epilepsies totally cured, hereditary Gouts almost eradicated, universal Lepers made clean, Stones in the Bladder and Kidnies laid quiet, Cancers healed or palliated, ulcerated Lungs made sound and scirrhous Livers made pervious."

EDITORIALS

LOUIS PASTEUR

(1822–1895)

This year marks the centenary of the birth of the man to whose researches are due the substructure of modern medicine in all its branches. It is unnecessary to outline his biography. The events of his life should be familiar to everyone, physician or layman, through the pages of one of the most interesting biographies ever published, the "Life of Pasteur" by Vallery-Radot. In its pages may be read in fascinating sequence the steps by which the son of the humble tanner at Arbois worked out, one after another, problems which changed the whole aspect, not only of science but of many branches of industry of vital importance to the welfare of the world.

Pasteur's first notable research was made in the domain of crystallography wherein he established the true nature of the tartaric acids and their salts. A few years later he disproved once and forever, by a series of brilliant yet seemingly simple experiments, the possibility of spontaneous generation. To us this fallacy seems so inane and so clearly impossible that it is hard to realize how acutely it occupied the minds of scientific men in the first half of the last century, and our admiration for Pasteur's genius is heightened immensely if we but glance at the entirely original experiments by which he completely shattered a so firmly held error.

The importance of the wine industry to the people of France could hardly be overestimated. It was threatened with great loss because of the prevalence of acid fermentation in the wines. Interested in the matter through his studies in tartaric acid and the tartrates, Pasteur pursued his researches on fermentation and early in 1864 announced that he believed that fermentation was the result of the activities of minute living organisms, and that these activities could be checked and wine preserved by the destruction of these organisms, by the action of heat and subsequent prevention of the access of air containing them, to the wines. The process became immediately famous under the name of "pasteurization."

A curious instance of the tenacity with which even scientists of the greatest standing will cling to erroneous opinions and decline to be convinced even by absolute demonstration is to be found in the attitude of Liebig, one of the greatest chemists of his time. In 1845 he had written: "As to the opinion which explains putrefaction of animal substances by the presence of microscopic animalculae, it may be compared to that of a child who would explain the rapidity of the Rhine current by attributing it to the violent movement of the numerous mill wheels of Mayence." In the summer of 1870 Pasteur visited Liebig at Munich for the express purpose of convincing him that fermentation and putrefaction were due to the activities of minute living organisms. Liebig received him courteously but refused to discuss the matter alleging indisposition.

From 1850 to 1865 the silkworm industry in France was threatened with absolute ruin. A disease had appeared in the silkworm nurseries which destroyed eggs, worms, chrysalides, and moths alike, and for which none of the many suggested remedies was of the least avail. It was characterized by the appearance of little black spots, hence receiving the name *pébrine* from their supposed resemblance to pepper grains. The great French chemist Dumas was also a Senator, and came from the town of Alais, one of the centers of the silkworm industry. Knowing Pasteur intimately and recognizing his powers of investigation he insisted that he should be sent to Alais to study the problem and if possible ascertain the cause and provide a remedy. Pasteur hesitated, stating that he had never even touched a silkworm, but at last consented to undertake the task.

Installing himself and his assistants in a small temporary laboratory at Alais, Pasteur threw himself with his accustomed ardor into his new task. He succeeded after overcoming many difficulties and much opposition from interested growers, in proving that *pébrine* was a parasitic disease which could be absolutely eliminated by destroying all eggs, cocoons or worms which showed any sign of the black spots which indicated the presence of the infecting organism.

While in the midst of his arduous labors to save the silkworm industry Pasteur at the age of forty-six was stricken with a hemiplegic attack which for a time threatened his life. He resumed his labors during his convalescence and the subsequent years of his life proved among the most useful to the world.

Pasteur was an ardent patriot. After the war of 1870 he returned to Bonn the diploma of the honorary degree of Doctor of Medicine which had been conferred on him by that University in 1868, and he sought to serve his country by researches on beer which might make French beer rival that which the Germans had heretofore excelled in making. For this purpose he visited London and studied the English methods of brewing. As a result of his labors he came to the conclusion that the souring of beer, which was the chief cause of the poor quality of that manufactured in France was due to the action of certain ferments and that beer could be sterilized by heating just like wine, without impairing its quality. This "pasteurization" of French beer resulted in a great improvement in it and was of much value to the brewing industry.

The story of the application of Pasteur's ideas on the roll of living organisms in fermentation and putrefaction to the causation of disease and to suppuration in wounds has been often told, nowhere better than in the pages of Vallery-Radot. To the Englishman, Lister, is due their first practical use. In 1865 he began his labors which instituted the era of antiseptic surgery. There is nowhere a more strikingly interesting episode in the history of medicine than the story of the receptiveness with which Lister seized and adopted to surgical purposes the results of Pasteur's work, and their mutual cordiality in the matter was a splendid example of what the relations of scientific men should be towards one another. It is curious that the leaders of French surgery, in spite of the terrible mortality from sepsis during the Franco-Prussian war, did not awaken to the value of the teachings of the great scientist in their midst. Pasteur was not a doctor of medicine and there existed in the French profession at that time marked jealousy of scientists who trespassed in medical fields. Even men like Claude Bernard, the great physiologist, were looked upon askance by those whose profession would most greatly benefit by their laboratory researches.

In 1873 Pasteur had been elected by a majority of but one vote, one of the Free Associates of the Academy of Medicine. Towards the end of the war Alphonse Guérin had stated his belief that the germs discovered by Pasteur might be associated with suppuration or putrefaction in wounds, and he had greatly lessened the mortality in his wards by a crude sort of antisepsis, but his voice was unheeded, as was that of Lucas-Championnière who visited Lister's wards at Glasgow in 1869 and came back to Paris full of the new idea. The first studies made by Pasteur himself on the germ origin of disease resulted in his famous discovery that the cause of anthrax was the organisms which had previously been observed by Davaine.

In 1878 the famous surgeon Sédillot, then seventy-four years old, wrote a paper "On the Influence of M. Pasteur's Work in Medicine and Surgery," in which he demanded recognition by the medical profession of the new era which would date from Pasteur's discoveries, and in which he incidentally introduced for the first time the word "microbe" as applicable to the minute beings which had now assumed such formidable prominence in the world.

In the early eighties were held the dramatic experiments on a large scale at various farms which proved once and for all the efficacy of the vaccines which Pasteur had evolved in the cure of chicken cholera, splenic fever and swine fever. Henceforth, these plagues, which had caused immense financial loss wherever they prevailed, were conquered. In 1884 Pasteur at the International Medical Congress at Copenhagen announced the great results of his studies in hydrophobia, that it was due to a specific microorganism, and could be cured by an attenuated virus; and on July 6, 1885, he successfully innoculated his first human subject, Joseph Meister, a little Alsatian, who had been bitten by a dog with rabies.

Although he was not destined to continue in person to add to the list of marvelous investigations which had so wonderfully changed the whole aspect of certain great industries and completely revolutionized medicine, Pasteur had the supreme joy of seeing ample provision made to carry on the work of his life to further triumphs. In 1888 the splendid monument to his fame, perhaps the greatest and most valuable tribute ever made to a man of science, the Pasteur Institute, founded by popular subscription, was opened. During his declining years he could see with his own eyes the brilliant early years of the famous research institute in which Roux, Calmette, Chamberland, and others of his famous and devoted co-workers were working, as he had taught and trained them to do.

When Pasteur passed away, on September 28, 1895, he might well have not only said but felt *nunc dimittus*. He had lived through many hard struggles to behold his own glorious apotheosis.

RICHARD BRIGHT

It is curious to reflect how frequently some discovery preserves a name to posterity when little or nothing is known of the life or any other achievements of the original owner. This is particularly striking in a study of medical nomenclature. Thus the names in daily use of many symptoms and diseases recall those of numerous deceased medical worthies who would otherwise by now have passed into complete oblivion. One of the many advantages brought about by the interest in medical history is the light which has been thrown on the characters and labors of those whose labors in their profession have led to this posthumous apotheosis. By research into their lives we generally find that those who have been thus honored were worthy representatives of the science and culture of their time and that although their names have become associated with but one event or discovery, their lives were full of hard work and their title to fame not fastidious.

Thus, Richard Bright (1789–1858) is chiefly known as the discoverer of the disease of the kidneys which bears his name, and the immense amount of research which led up to his discovery with the many observations which he made incidentally and communicated in many remarkable papers. His two volumes of "Reports of Medical Cases" are full of valuable observations on many morbid conditions, and he was a frequent contributor to *Guy's Hospital Reports*. He was elected Assistant Physician to Guy's in 1820, and Physician in 1823, serving in that capacity until 1843, when he was made Consulting Physician. During many of these years he is said to have passed more than six hours daily working in the wards or autopsy room of the Hospital, besides lecturing on medicine and materia medica. He also had an enormous practice and was the leading London consultant of his day.

It is not our intention to direct our reader's attention so much to Bright's professional achievements as to recall the fact that he also was a traveler and wrote most entertainingly on other than medical topics. While studying medicine at Edinburgh, he went with Sir George Stuart Mackenzie and Sir Henry Holland, later also a distinguished physician though not eminent for scientific acquirements, on a voyage to Iceland, of which Mackenzie published an account, for which Bright wrote the chapters on zoology and botany. On his return he resumed his medical studies, receiving his degree in 1812.

Two years later, in 1814, Bright started off on a long tour through Belgium, Holland, and Germany. A desire to enjoy the excitement of the Congress of Vienna induced him to go from Berlin to that city, and thence he traveled through Hungary, returning to Belgium, and arriving at Brussels two weeks after the battle of Waterloo. In 1818 he published a book, "Travels from Vienna through Lower Hungary; with some remarks on the state of Vienna during the Congress in the Year 1814," a copy of which is now before me and has proved most delightful reading.

Bright's description of Vienna during the meeting of the Congress is one of the most vivid pictures of that interesting occasion that has been preserved to us. He saw Marie Louise and her little son, the King of Rome, L'Aiglon, to whom he was presented, and by whom he was greatly charmed. He went to many social gatherings where he saw the numerous kings, potentates, and statesmen, who were striving to form a "league of nations" and whose efforts seem like a rehearsal of some more recent historic events; and he comments shrewdly on the difficulty of ascertaining historic truths when in the very center of a historic event, so many false statements being current that no one on the scene could pretend to know the facts.

Leaving the somewhat hectic atmosphere of Vienna, Bright made a long journey through Hungary, a country at that time very little frequented by English travelers. He was greatly interested in the numerous gypsies, or Cyganies, as they were usually termed, and devotes many pages to an account of them. He learned many of their words and phrases and was delighted on returning to England to find that they were the same in the language of some gypsies whom he encountered there. The social status of the various ranks in Hungary were also a matter of which he found much to say. The poverty and ignorance of the peasants formed a marked contrast to the wealth and almost medieval feudal power of the nobility. Many of the great landowners among the latter possessed the right of administering so-called justice, and he saw in the castles the most loathesome prisons into which men were thrust and kept chained for years.

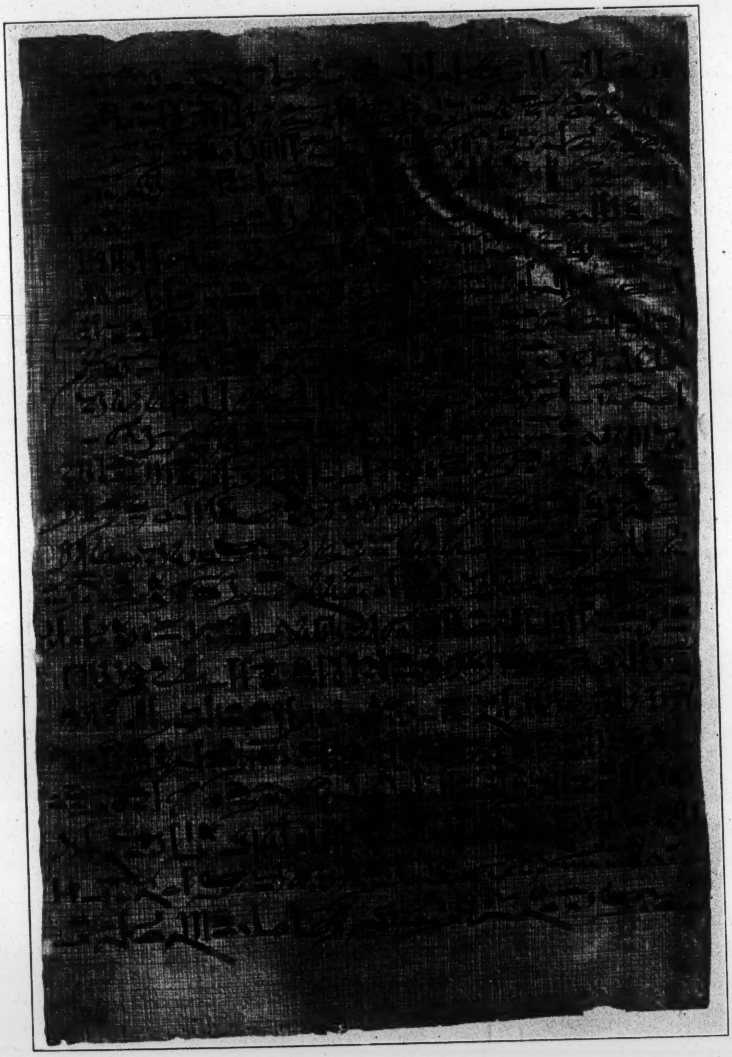
Bright's book has become very rare but it is well worth reading, not only from interest in the author, but because of its intrinsic merit. It is illustrated with some very handsome copper plate engravings and contains several maps.

AN EGYPTIAN MEDICAL TREATISE OF THE SEVENTEENTH CENTURY B. C.

The New York Historical Society's *Quarterly Bulletin*, April, 1922, contains a most interesting description by James Henry Breasted of the Edwin Smith Papyrus, an Egyptian manuscript written in the seventeenth century B. C. The Papyrus was purchased in Egypt in 1862 by Mr. Edwin Smith, a pioneer American student of Egyptology, and presented to the New York Historical Society by his daughter, Miss Leonora Smith. Professor Breasted describes it minutely and gives a very complete analysis of its contents. The Papyrus is made up of several parts, the most important of which contains, as Professor Breasted says, "the most carefully made and most systematically arranged observations on the human body and its ailments which have thus far survived from an age so remote."

It describes forty-eight cases which are grouped in sections according to their anatomical classification, as follows:

I. Head: Calvaria (Cases I–X).
II. Nose (Cases II–XVII).
III. Mandible, Ear and Lips (Cases XVIII–XXVII).
IV. Throat and Neck: Cervical Vertebrae (Cases XXVIII–XXXIII).
V. Collar Bone and Shoulders: Clavicle and Scapula (Cases XXXIV–XXXVIII).
VI. Thorax and Mammae (Cases XXXIX–XLVII).
VII. Spine (Case XLVIII, incomplete).



A PAGE OF THE EDWIN SMITH PAPYRUS
The writing is the rapid cursive Egyptian hand, called *bieratic*, in which the original heiroglyphic pictures are abbreviated and rounded off until they have lost their picture form. The manuscript dates probably from the latter part of the seventeenth century B. C. (By courtesy of The New York Historical Society.)

Each case is methodically described as follows:

(*a*) *Title*, always beginning: "Instructions for . . ." (name of ailment).

(b) *Examination*, always beginning: "If you examine a man having . . ." (symptoms).
(c) *Diagnosis*, always beginning: "You should say concerning him 'A sufferer with . . .' "(name of trouble follows).
(d) *Verdict*, always one of three:
   1. "An ailment I will treat" (favorable).
   2. "An ailment I will contend with" (doubtful).
   3. "An ailment I will not treat" (unfavorable).
(e) *Treatment.*
(f) *Explanatory glosses* (seventy in all).

Although part of the Papyrus has been lost, nevertheless what remains exceeds in bulk all the other leading medical Papyri; Ebers, Hearst, and that at Berlin, and its contents are vastly more interesting because it contains what are evidently the fragments of a great book on medicine and surgery, with case-reports, having the diagnoses and prognoses included, whereas the greatest portions of the other Papyri are merely collections of recipes and contain but scanty information on the nature of the cases in which they are to be employed.

In the section on injuries of the head there are indications that the ancient Egyptians had some idea of surgical practices, for the surgeon is bidden to "probe the wound"; and in a case of "fracture of the skull under the skin" he is charged to open at the contused point and "to elevate the depression outward." If, as is probable, some form of trephining is here implied, it is, as Professor Breasted points out, the earliest known reference in literature in this operation. In the section on the vertebrae of the neck the physician notes that in dislocation of the cervical vertebrae the patient loses control of his arms and legs and excretory organs and the "verdict," or prognosis, is hopeless. Such a dislocation is called a "*wenekh* of the vertebrae of the neck" and is distinguished from a "*sehem* in the vertebrae of the neck" which is a fracture of the vertebrae, causing deafness, loss of speech, and loss of control of the arms and legs. In the section devoted to the collar bone and shoulders the methods for reducing dislocations of the clavicle and scapula are described.

The Edwin Smith Papyrus contains a passage on the circulation very similar to one contained in the Papyrus Ebers: "There is in it (the heart) a canal leading to every member of the body. Concerning these, if the physician . . . place the fingers on the back of the head, on the hands, on the pulse, on the legs, he discovers the heart, for the heart leads to every member, and . . . it beats (literally 'speaks') in the canals of every member." A very early reference to a circulatory system.

The author points out the fact that these case records contain many glosses or explanations of terms used in them, and he conjectures that this indicates that the records constitute the remains of a very much older work on medicine and surgery, so ancient that in this edition of 1600 B. C. it was necessary for the scribe to annotate the text with explanations of obselete terms.

Professor Breasted intimates that this most valuable contribution to medical literature is only a preliminary report. It is sincerely to be hoped that in the near future we may be favored with a translation of the entire document as these specimens of its contents serve only to indicate what a wonderful mine has been opened in a hitherto unknown region of medical history.

BOOK REVIEWS

Life of Elie Metchnikoff, 1845–1916. By Olga Metchnikoff with a preface by Sir Ray Lankester, K.C.B., F.R.S., Boston and New York: Houghton Mifflin Company, 1921.

Metchnikoff's life contains more of pathos and of thwarted endeavor, and at the same time, more of success than that of almost any other great man of our time. In the height of its joys and the depths of its sorrows his life in a measure epitomizes the history of the Russian people. Descended on his father's side from an ancient Moldavian house, on his mother's from a Jewish statesman who had rendered great service to the Czar, he grew up in an atmosphere little calculated to foster the scientific spirit; nevertheless such spirit appeared in him at a very early age. Under great difficulties, partly domestic, partly caused by eye troubles; he acquired a knowledge of biology, and like his great countryman Kovalevsky with whom for a time he worked, he made important contributions to embryology, especially to the subject of the development of the lower forms of life. A study of germ layers and of metamorphosis and other cellular processes led him to an investigation of intracellular digestion. Observing this process, to which he gave the name "phagocytosis," in the lower forms of life, he gradually came to see its significance for pathological processes in higher animals. Through such studies which inevitably attracted him to a contemplation of human disease, he became identified with medicine, and now stands as one of the great benefactors of medical science, although like Pasteur he never studied medicine.

He married young; unfortunately his wife contracted tuberculosis, and although he made every conceivable sacrifice of money and position, he could not save her life. Her death threw him into a temperamental melancholy and caused an attempt at suicide. Fortunately, he took an overdose of morphine, vomited and recovered. A return to scientific pursuit reestablished his contact with life. His second wife, whom he wedded in 1875, proved an ideal companion. She is the author of the biography, which she could never have written had she not been completely imbued with Metchnikoff's ideals and had she not familiarized herself with the technical side of his work. Deep study of her husband's thoughts and researches is apparent on every page of the book. Without pedantry, without minutiæ, she traces Metchnikoff's zoological and pathological investigations from their beginning to their culmination, and does it with a self-restraint, a simplicity and a charm of diction that makes the book a truly great biography. Contemplating her fine character and Metchnikoff's tremendous mentality, what a pity it is that the latter was so much of a pessimist that "he looked upon procreation of other lives as a crime on the part of a conscious being."

Metchnikoff's initiation into infectious diseases was not unlike that of Pasteur. In the summer of 1880, the cereals in Russia were invaded by a harmful beetle, *Anisoplia austriaca*. Taking up the study of this scourge he found in dead bodies of the anisoplia a small fungus with which he succeeded in infecting healthy beetles. This became the basis of a satisfactory attack upon the scourge and proved the starting point of his researches in infectious diseases. He first turned to erysipelas and relapsing fever in an endeavor to discover the part played by phagocytosis. It was at this time that the Russian environment, long irksome, became for him so hopelessly limited intellectually that he determined to settle in Berlin. But the German scientists received him coldly; in despair, he turned his steps toward Paris and found there the haven he sought. In later years, Koch and the other German scientists, who had at first opposed his theories, became his warm adherents; but Metchnikoff though greatly pleased could never entirely forget their early hostility.

The phagocytosis theory found its chief opponents among the German humoralists who contended that antitoxin immunity was evidence against the importance of the part played by cellular immunity. Metchnikoff, however, showed by innumerable ingenious experiments that defensive substances in the last analysis come from cells. Although, at present it cannot be said that the controversy regarding phagocytosis and humoral immunity is entirely ended, scientists are generally in accord in believing that serum bacteriolysis and phagocytosis are at bottom the same process.

In his later years Metchnikoff concerned himself with the problem of premature senility. He taught that a man should try so to live that the instinct for death would be natural. If our disharmonies with nature were banished, old age would come as a physiological process: "Our manner of life will have to be modified and directed according to rational and scientific data if we are to run through the normal cycle of life—orthobiosis." In its origin premature senility is, in Metchnikoff's opinion, due to poisons absorbed from the intestinal tract, which in a man has too great a length—a vestige of his early ancestry. His researches in this field led him to formulate the theory that toxins produced by bacteria in the intestinal canal are the cause of degenerative processes, and that a modification of the diet, especially the use of certain bacteria causing acidification of milk, can prevent the formation of these toxins. This particular phase of his work brought him a good deal of notoriety, likewise some unpleasantness through the efforts of certain persons to commercialize his name.

In 1908 Metchnikoff had a memorable visit with Tolstoi at Iasnaia Paliana. Tolstoi could not see any value in the study of abstract questions. "What good can it do man to have a notion of the weight and dimensions of the planet Mars?" he said. Metchnikoff naturally defended abstract investigations. The two men differed also about music. Tolstoi liked Chopin and Mozart, and did not care for Beethoven as he states in his letters; Metchnikoff on the other hand was passionately fond of Mozart and Beethoven. Both agreed as to Wagner and modern music, thinking it unintelligible and lacking in harmony, in which opinion they showed that the conservatism of age was creeping upon them.

Metchnikoff was a deep student of Goethe in whose "Faust" he found much to support his own views as to the disharmonies of human nature.

The Great War was a serious trial to Metchnikoff. He had many friends in Germany with whom he did not like to break. Moreover, he lost his assistants who were one by one drawn into the service. He continued, however, to work in the almost deserted Pasteur Institute until the heart affection, of which he had intimation for some years, became too pronounced. His disease was evidently a progressive myocarditis with attacks of angina pectoris and probably of pulmonary edema. During his attacks he had a consciousness of approaching death but never any fear. "As I prepare to die I have not the shadow of a hope of life beyond, and I calmly look forward to complete annihilation," he wrote at the close of a particularly severe paroxysm. When three years later he lay dying in the Institute Dr. Salimbeni entered the room. "Salimbeni, you are a friend; tell me, is it the end?" And as he protested, he added, "You remember your promise? You will do my post-mortem? and look into the intestines carefully for I think there is something there now." How these words, so consciously spoken, must have harrowed the soul of his wife who stood at his bedside.

Science was Metchnikoff's religion. "If an ideal is possible, capable of uniting men in a sort of religion of the future, it can only be based on scientific principles. And if it is true, as is so often affirmed, that it is impossible to live without faith, that faith must be faith in the power of science."

In summing up the work of Metchnikoff, we may say that he was an originator, not a follower, and that he rightly belongs in that great pantheon of Modern Science in which the world has placed men like Pasteur, Lister, Ehrlich and Koch.

David Riesman.

A History of the National Tuberculosis Association, The Anti-Tuberculosis Movement in the United States. By S. Adolphus Knopf. New York: National Tuberculosis Association. 1922.

Although an institution which only came into existence in 1904 could hardly lay claim to historic celebrity, the National Tuberculosis Association has made so much history during its brief life that it is well to have an authentic and official record of its early years before they become obscured by the passage of time.

This book begins with a brief sketch of the early efforts to combat tuberculosis in the United States and then gives the details at length of the organization of the National Tuberculosis Association. A report of the events at the seventeen first annual meetings follows, and then short biographical sketches accompanied by portraits and bibliographies of the officers of the Association from the earliest times to the present day. The only omission is the biography of the author of this "History," Dr. S. Adolphus Knopf, who although one of the most distinguished workers in the Association has modestly refrained from any attempt at autobiography and merely publishes a bibliography of his writings, which is, however, alone of sufficient merit to assure him distinction in his field of work. Some criticisms may be aroused by the inclusion of biographies of Presidents Cleveland, Roosevelt, and Harding, who all served the Association as Honorary Vice-Presidents. The sketches, however, only deal with such of their activities as bore on the work of the Association and are, therefore, most interesting. The book is invaluable as a reference handbook for those interested in anti-tuberculosis work, whether physicians, social workers, or hygienists, and as such lays us under a debt of gratitude to its author, Dr. Knopf.

Francis R. Packard.

Physic and Fiction. By S. Squire Sprigge. London and New York: Hodder & Stoughton and Oxford University Press. 1921.

This volume contains twelve most interesting chapters on various borderland topics of vital interest to the lay as well as the medical world. The first on "Medical Priestcraft" deals with an aspect of medical practice which presents itself daily to every professional man: "the distrust of the public and the unreasoning faith of the public, for these are the things which lead to disappointment when impossible events do not take place, and the want of appreciation when great deeds have been accomplished," both of which have been temporarily increased by the great advance in general knowledge, but both of which will cease when the aims and principles of medicine are better appreciated as they will be when general education becomes yet more advanced. The Author elaborates this thesis in such a way as to be helpful in broadening the views of the profession and arousing its interest in some of the new public health movements which will increase the usefulness of its members. In "The Old-Fashioned Doctor" a careful study is presented of the way in which startling innovations, such as the discovery of the circulation of the blood, or antisepsis, strike the physician who has been, heretofore, successful and skilled in his art. Can he be expected to yield at once to the evidence of such a complete reversal of his views? Is he justified in feeling somewhat sceptical of such complete overthrows of all he has heretofore held as gospel? The tactful skill with which Sprigge presents the attitude assumed by the honest conservative, confronted by such a crisis, is quite remarkable. Chapters III and IV are devoted to the physician in fiction, especially as he figures in the pages of Dickens and Thackeray. They are most enjoyable, recalling old familiar figures and revealing the attitude of the novelists towards the various aspects of the profession as revealed in their creations. Sprigge dwells with justice on the pathological, mental and physical characteristics presented by so many of the characters in Dickens' novels. What the casual reader might consider merely eccentricities are in reality manifestations of mental perversion, and the grotesque physique or actions of many of the characters are accurate pictures of pathological conditions.

There is an interesting account of Dr. John Elliotson, the famous London physician, whom Thackeray immortalized in the dedication to "Pendennis," with the story of his professional ruin through his credulity and belief in the "magnetic" manifestation of some impostors. In "They All Lived Happy Ever After" there is an excellent discussion of the problems of eugenics, in which the fallacies, based on the study of the Jukes genealogy, are cleverly recounted. The essay on "Prizes and Performances" can be read with profit by all who are interested in medical education, and that on "Some Public Developments of Medicine" is an interesting review of the great progress made in legislative sanitation in recent years, with an especial appeal for study and care in taking up the problems of reconstruction which have arisen from the War. "The Pathologist in the Street" is an entertaining discussion of the value of the snapshot diagnoses which every doctor makes with some frequency during his daily encounters with his fellow-beings. Artistic representations of medical topics are discussed in a scholarly chapter which throws a new sidelight on a much discussed topic. In some "Comfortable Words About Poisoning" the reader is shown by the recital of some typical cases, how rarely those guilty of such crimes escape detection, and how little secret knowledge of poisonous substances is possessed by those who might make an evil use of it. The last essay "Primordial and Other Stuff" is a thoughtful study of the medical attitude towards spiritualism and the supernatural.

Few books have appeared in recent years which can be more heartily commended to the perusal of medical men in every walk of the profession than this. Dealing with subjects, many of which are present in our minds almost daily, this book helps to clear our ideas and gives a fresh turn to our somewhat jaded reflections on them.

FRANCIS R. PACKARD.

PASTEUR AND HIS WORK. By L. Descour (Médecin Inspecteur de l'Armee). Translated from the French by A. F. and B. H. Wedd, M. D. New York: Frederick A. Stokes Company, 1922.

If any proof, beyond the vast results of his researches, were to be sought of the greatness of Pasteur, it might be found in the numerous literary tributes to him which have appeared since his death. Of these by far the most important is his "Life," by his son-in-law, Vallery-Radot, one of the real classics of biographical literature. In it all the details of his domestic life and scientific career are given with a delicacy, and charm which has rarely been equalled. His former assistant, Emile Duclaux, wrote a fascinating record of his scientific work, "Pasteur: Histoire d'un Esprit." Both of these works have been presented to the English reader in most excellent translations, and have enjoyed widespread popularity.

Descour has written a new biography of Pasteur and A. F. and B. H. Wedd have made a most acceptable English Translation of it. There is a very short preface, hardly more than a translation of some remarks in praise of Descour's book, made by Roux when he presented it to the French Academy of Medicine, and no further explanation is offered for the existence of the volume. It is impossible not to make comparisons between it and the "Life of Pasteur" by Vallery-Radot and yet it is not quite fair to do so. The previous work has so fully covered every phase of Pasteur's activities that nothing new can be brought forward and any subsequent work must be more or less based on its contents. Descour's book may be regarded as a condensation of the larger work of Vallery-Radot and is authentic because the book on which it is based is so. It is interesting because it is so well written, and it is to be hoped it will be widely read and stimulate further interest in its subject. Osler said in his introduction to Mrs. Devonshire's translation of Vallery-Radot's "Life." "This is a biography for young men of science, and for others who wish to learn what science has done, and may do, for humanity." If Vallery-Radot's "Life of Pasteur" is not available we could certainly use the same statement as regards the present work. There is one minor query which arises in the mind of the reviewer. Why should the name of Duclaux be spelt Ducleaux throughout the book in the many places in which it recurs? It certainly is not a typographical error.

FRANCIS R. PACKARD.

MODERN ITALIAN SURGERY AND OLD UNIVERSITIES OF ITALY. By Paolo De Vecchi, M. D. Paul B. Hoeber, New York, 1921.

If anyone were asked to what department of medicine Italy had been the greatest contributor, anatomy would be the ready answer, for there is hardly an organ or tissue in the human body which has not connected with it the name of an Italian anatomist. The development of the study of anatomy might be said to be entirely due to the Italians; but it is not in this field alone that Italy has been a notable contributor for her schools of medicine were the first and for four or five centuries the foremost of the world. These ideas of Italian medicine are generally accepted, but it is equally true that most medical men of our day would say that modern Italy has been a follower, rather than a leader, despite the familiar work of such men as Bassini, Bastianelli, Codivilla and others. Many American surgeons and physicians were rather surprised to see the excellent work and organization of the medical department of the Italian army during the late war and all who visited their hospitals at the front or at the bases returned full of praise of what they had seen.

Dr. De Vecchi in this volume on "Modern Italian Surgery" shows very clearly that the modern Italian surgeon, although he may not have made as much noise about his work as the surgeons of some other country, has nevertheless not only kept abreast of modern methods but in many instances has been a leader.

This volume does not purport to be a scientific contribution to surgical literature, but a description of modern Italian surgery. The object of the author is to familiarize the American surgeon with the Italian school of surgery of today.

The first chapter describes briefly Italy's struggle for liberty and unification, which had its culmination in the acquisition of Trent and Trieste. The next four chapters deal with the work done by the medical men in Italy during and just after the great war. It would appear that in the reconstruction work the Italian government and surgeons had set an example which other nations might do well to study. The chapter dealing with the assistance offered by the government to crippled soldiers is very interesting and could be read with profit by those engaged in or interested in reconstruction work in this country.

The cinematic amputation, first suggested by Vanghetti, not a surgeon but a medical man, is described in detail and apparently the method is now being quite extensively employed by the Italian surgeons with good results. This method of rendering a stump useful after amputation has hardly been given the trial in this country, which it would seem to deserve.

The portion of the work dealing with orthopedic surgery and the care of crippled children, in which the Italian surgeons have excelled, is most interesting.

The latter chapters describing the universities of Italy will be found of value to those engaged in the teaching of medicine. The course of medical study extends over six years and we are informed:

> That the standard of medical education is the same all over the country, that no medical schools are recognized or even permitted in Italy except those approved by the Government which are under the control of the universities, and that nobody is allowed to practice medicine or surgery unless he has received the proper degree of "Laurea."

Separate chapters are given to the description of the Universities of Rome, Bologna, Modena and Parma, Padua, Pavia, Turin, Genoa, Pisa, Siena, Naples, Sicily, Sardinia, and the Institutes of Milan and Florence.

The last chapter on surgical literature enumerates the most important contributions of Italian surgeons.

Certainly the American profession is indebted to Doctor De Vecchi for this interesting book which places before it every phase of modern Italian surgery. No American surgeon or physician should think of visiting Italy without first reading this book and without taking it with him as a guide.

John H. Gibbon.